TEXTILE READER'S GUIDE

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Abstracts

[521]

FIBERS A

Natural fibers A 1

The internal structure of cellulose microfibrils

A. Frey-Wyssling. *Makromol....Chem. 6,* 7-14 (1951).

The electron microscope shows that native cellulose obtained from various sources contains fibrils of diameter 200-300A. and, therefore, about 2000 parallel chain molecules. X-ray diffraction shows that a micellar strand in a crystalline region has a diameter of about 60 A., so that a microfibril contains 15-25 micellar strands. Between the crystalline regions are intermicellar spaces which can be penetrated by reagents and cause swelling or substitution reactions.

Network structure and orientation of cellulose fibers

W. Kast. *Makromol. Chem. 6,* 114-26 (1951).

Cellulose is considered as a three-dimensional network, with the crystalline regions as the cross links. Kratky's theory of "leaflets" and "rods" acting during the stretching of such a network is shown to be unsatisfactory for cuprammonium rayon and viscose rayon. Hermans' "degree of orientation" factor is used to illustrate the results obtained for various fibers and various stretching procedures as compared with the results expected from Kratky's theory. The stretching process is said to affect network formation, which depends on the ratio of the stretching velocity to the relaxation frequency of the cross links.

Stretching artificial cellulose fibers

P. H. Hermans & W. Kast. *Kolloid Z. 121,* 21-32 (1951); *in German.*

Two independent sets of data on axial and planar orientation state of platelet-forming particles. The half-parameter method of Kast and the fluctuating square method of Hermans used to measure the orientation state of cellulose are discussed. Comparison of the observed and calculated parameters shows that appearance of various proportions of axial and planar orientation can be followed not only during different

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stretching experiments, but also during the course of the same stretching experiment. These stretching procedures are used to explain the velocity of orientation and relaxation frequencies of the wetability of cellulose during stretching of the fiber.

Artificial fibers A 2

The absorption and loss of water by rayon

D. Vermaas. *Enka Breda Rayon Revue 5*, 57-64 (June 1951); *in Dutch.*

This article deals with the phenomena which can be observed when cellulose fibers are brought into contact with water, either in the vapour or in the liquid phase. Apart from the transport of water through the single fiber and through fiber masses, the author discusses the equillibrium sorption and swelling, shrinkage phenomena, the heat effect involved in the uptake of water, and the influence of the water content on the mechanical properties of the fibers.

Effect of light on synthetic fibers

Arnulf Sippel. *Melliand Textilber. 32*, 205-209 (Mar. 1951); *in German.*

After giving a general review of the optical properties of synthetic fibers, the author discusses the effect of both artificial light and daylight on their stability. The decomposition processes, and the agents that accelerate or retard them, are discussed.

Method of producing synthetic fibers from polymers and copolymers of acrylonitrile

Arthur Cresswell (to American Cyanamid Co.) USP 2,558,731, July 3, 1951.

The method of producing a synthetic fiber from a soluble, thermoplastic product of polymerization of a polymerizable mass comprising mainly acrylonitrile, the method of comprising extruding the product in the form of a fiber from a water-coagulable solution of the polymerization product dissolved in a concentrated aqueous solution of a water-soluble salt which yields highly hydrated ions in aqueous solution; immediately after extrusion contacting the extruded mass with a liquid coagulant comprising water, the coagulant being at a temperature not exceeding + 10° C., thereby to precipitate the product from the solution as a stretchable, gelled fiber; continuously stretching the gelled fiber, while it is in contact only with a fluid medium comprising moisture, at a temperature within the range of about 70° C. to about 100° C.; and continuously drying the stretched

fiber.

Method of producing staple fiber from polymers and copolymers of acrylonitrile

Arthur Cresswell (to American Cyanamid Co.) USP 2,558,732, July 3, 1951.

The method of producing a crimped, synthetic fiber product containing in the molecules thereof an average of at least about 85% by weight of combined acrylonitrile, the method comprising continuously extruding the product in the form of a fiber from a water-coagulable solution thereof in a concentrated aqueous solution of a water-soluble salt which yields highly hydrated ions in aqueous solution; immediately after extrusion contacting the continuously moving, extruded mass with a liquid coagulant comprising water, the coagulant being at a temperature not exceeding + 10° C., thereby to precipitate the product from the solution as a stretchable, gelled fiber; continuously stretching the gelled fiber at least 100% in the presence of moisture and at a temperature within the range of about 70° C. to about 110° C.; cutting the continuous length of stretched, shrinkable, aquagel fiber into discontinuous lengths while the fiber contains, by weight, from about 13% to about 75% of water and correspondingly from about 87% to about 25% of the aforementioned polymerization product; and drying the discontinuous lengths of the cut fiber in a fully relaxed state thereby to obtain a crimped fiber of the polymerization product.

Protein threads with resistance to hot acid solution

Brit. P. 645,390. Courtaulds, Ltd. *Textile Mfr. 77*, 260-1 (May 1951).

Artificial protein threads having improved resistance to attack by boiling water and hot dilute acid solutions are produced by subjecting freshly spun protein threads to a hardening treatment in a bath containing formaldehyde and one or more metal salts other than sodium chloride. The threads are subsequently treated at a temperature of from 35° to 60° C in an insolubilizing bath containing in each liter of solution from 500-800 grams of sodium bisulfate and from 5-15 grams of formaldehyde. Suitable salts for use in the bath are sodium sulfate, magnesium sulfate, and aluminum salts.

Synthetic fiber structure investigation

Paul-August Koch. *Textil-Rund. 6*, 111-16, (1951).

The author discusses the advantages of determining the angle of a torsional rupture as a means of estimating the wear and brittleness qualities of synthetic fibers. The value obtained is independent of the fineness of the fiber, but is related to the nature of the material and to structural changes due to stretching. Broadly speaking (that, making allowance for the degree of stretching) the angle of fracture is also a good guide to the type of fiber being examined. A table is given showing the range of fracture angles of different material. A high angle is coincident with lower flexibility.

YARN PRODUCTION B

Fiber preparation B 1

Action of beaters on cotton

J. C. Whitwell, T. Lemiszka & V. L. Hughes. *Textile Res. J. 21,* 556-64 (Aug. 1951).

Work on the degradation of cotton during mechanical processing includes a study of the action of the pickers under various operating conditions. The results indicate that blade and carding beater types cause different amounts of degradation, that amount of degradation caused by a very close setting can be differentiated from that due to wider spacings, and that the speed of rotation of the beater has a degradation effect which is detectable only after several consecutive picker operations under similar conditions of the other variables is readily discernible.

Comments on rejected picker laps

Staff. *Textile Industries 115,* 164-5 (July 1951).

Five methods of running sub-standard picker laps are discussed: (1) A set-back or extra finisher picker with a regular feed apron is used. Two light and two heavy laps are placed on the feed apron and new laps run. If the new laps are out of tolerance, they are run again. (2) A rack at the back of regular pickers is used to hold rejected laps and to feed them back into the pickers along with the regular stock. (3) Light and heavy laps are taken to the card room in pairs, based on the theory that the resultant light and heavy card would even up when run on the drawing. (4) Another method consists of having one close tolerance and a wider tolerance above and below the close tolerance. Laps in the first tolerance are passed; laps in the next tolerance are kept separate and paired for running in the card room; and laps outside the

greater tolerance are handled as waste. (5) This last method consists of keeping the rejected laps separate without regard to whether they are light or heavy and running them on certain cards.

Drop in mill efficiency traced to opening room

Anon. *Am. Wool Cotton Reptr. 65,* 9-10, 42-3 (Aug. 16, 1951).

See front section.

Effect of opening and picking on the staple length of cotton

V. E. Oleman. *Textile Bull. 77,* 68, 69 (May, 1951).

See front section.

Model 6 picker with three major improvements

Anon. *Saco-Lowell Bull. 23,* 1-15 (June 1951).

See front section.

The W-6 waste machine

Anon. *Saco-Lowell Bull. 23,* 16-18 (June 1951).

The new W-6 Waste Machine is constructed of fabricated steel instead of cast iron. Sixteen-inch cylinders are used rather than the former thirty-inch.

The smaller sized cylinder performs a more efficient and effective opening of the waste. The speed of the cylinder was increased to approximately 1390 rpm for each section, thus gaining a higher production than was possible on the old model. New cylinder construction makes it unnecessary to remove the cylinder from the machine for the replacement of lags. The hardwood lags are fitted with a steel face plate, thus eliminating the securing bands required on the older type of cylinder.

Waste feeder is smaller fiber meter

Anon. *Textile World 101,* 154 (Aug. 1951).

A 24-in. waste feeder, a smaller counterpart of the 36-in. Fiber Meter, has been announced by W. D. Dodenhoff Co., Inc., Greenville, S. C. The new unit, designed for present Fiber Meter systems or for new installations, automatically weighs out waste in increments of as little as 2 oz., with a variation of ⅛ oz. Any staple fiber can be fed. Over-all dimensions of the machine are about 4 x 2½ x 5 ft.

Carding and combing B 2

Builds stripper gauge for Whitin cards

Staff. *Textile Industries 115,* 171 (July 1951).

A description is given for making a handy

gauge for setting stripping stands on Whitin cards. An accompanying illustration shows how the gauge is used.

Card stripping methods blamed for variation in drawing sliver

Staff. *Textile Industries 115,* 165, 167 (July 1951).

In answer to an inquiry on variations in drawing sliver, a contributor writes that the method and schedule of stripping cards might be the trouble. A maximum stripping period of 3 hours is recommended with cards stripped alternately where practical. Installation of continuous strippers, which would eliminate any faulty stripping, is the most effective method of stripping, and then card cylinders would only require brush stripping when being prepared for grinding. Other factors to watch in avoiding variations in card and drawing sliver include: good even picker laps; good piecings when dropping in new laps in cards; well lubricated card feed rolls; proper pressure on calender-roll pressure springs, etc.

Changing feed laps on cotton combers

O. C. Hinson. Brit. P. 643,477. *Textile Mfr. 77,* 259 (May 1951).

Means to effect the release and descent of the fresh roll automatically in properly timed relation to the stage of exhaustion of the working roll is claimed.

Controlling waste along with neps

Elliott B. Grover. *Textile Bulletin 77,* 65-6, 68 (May 1951).

See front section.

Deterioration of leather condenser tapes and aprons

Paul J. Martin. *Textile Age 15,* 14-15 (Aug. 1951).

See front section.

Improving efficiency of open type English scribblers and cards

H. V. Tetlow. *Textile Mfr. 77,* 288-291 (June 1951).

See front section.

Lap changer for combing machines

Odus C. Hinson (to Terrell Machine Co.) USP 2,559,074, July 3, 1951.

In a textile machine operating upon fiber supplied thereto in rolled lap form, in combination, rotatable supporting means supporting a working lap roll in feeding position, means holding a fresh lap roll above the working lap roll, and means automatically putting the fresh lap roll in place with its periphery resting upon the rotatable supporting means as the working roll approaches exhaustion.

Nep count reduced by opening and picking changes

Tom S. Harris. *Textile Industries 115,* 98-100 (August 1951).

See front section.

What Makes neps?

Anon. *Am. Wool & Cotton Reptr. 65,* 17-18, 55 (Aug. 9, 1951).

See front section.

Tape condensers. I.

W. J. Crofts. *Textile Industries 115,* 82-4, 178 (July 1951).

The production of the tape condenser is limited only by the quality and amount of stock that the preceding sections of woolen card will satisfactorily comb out. It has a greater condensing capacity than the ring condenser, and a more uniformly condensed roving can be obtained on the double-rub tape condenser. Drafts at the condenser, dividing rolls setting, and tape selection are discussed with the finisher doffer and comb also considered.

Wool carders meet in Providence

Staff. *Textile Industries 115,* 107 (July 1951).

A brief report is given on the discussions held at the recent meeting of the Carders' Guild Section, National Association of Woolen and Worsted Overseers. Topics included vacuum stripping, tape performance, and card production.

Drafting and roving B 3

Adjustable self-weighted rollers

Brit. P. 645,251, Fonderie de Precision. *Textile Mfr. 77,* 260 (May 1951).

Pressure rollers in drawing devices, and in particular "floating rollers", comprise a hollow cylinder, inside which loads are introduced. Each load is constituted by a cylindrical body with the surfaces of contact between the load and pressure roller having a coefficient of friction such that the load is driven in rotation by the roller.

Bobbin spindle construction

John J. Pichette. USP 2,559,461, July 3, 1951.

Bobbin spindle mounting comprising a frame,

a sleeve thereon, a flange on the sleeve cooperating with the frame to form a chamber, a spindle bearing in the chamber, a spindle in the bearing, a second bearing in the sleeve receiving the spindle in spaced relation to the first named bearing, the latter being radially movable in the chamber, and means supporting and swiveling the second bearing in the sleeve.

Method of making textile units for fiber drafting

John W. Baymiller (to Armstrong Cork Co.) USP 2,557,932, June 26, 1951.

In the fabrication of drafting aprons, the steps of: wrapping a sheet of flexible, resilient, wear-resistant material of substantially uniform thickness squarely about a mandrel with a coating of lubricant interposed between the sheet and mandrel and with the free edges of the sheet projecting radially from the mandrel; bringing the free edge portion of the sheet into abutting relationship; severing the free edge portions of the sheet extending above the portion of the sheet disposed in engagement with the mandrel to form a tube of substantially uniform thickness about the mandrel; and simultaneously with the severing step heating the joint where the free edges ajoin to weld the same into a unitary structure which may be removed from the mandrel.

Roller covering

Brit. P. 645,475, Dayton Rubber Co. *Textile Mfr. 77,* 261 (May 1951).

A roller covering that is resistant to lapping and eyebrowing, has good drafting characteristics, low static charge build-up, good ageing and wear-resisting properties, and is resistant to attack by oil and abrasives is claimed. The covering has a vulcanized resilient body of acrylic nitrile butadiene copolymer which has a microscopically pitted surface and has uniformly dispersed through it particles of finely ground rubber having a hardness different from the hardness of the vulcanized resilient body. The particles are removed from the surface by grinding and are free to fall out when reaching the outer surface while the surface is wearing off.

The mill of today. Part 26 — Production limitations of roving frames

Robert Z. Walker. *Textile Bull. 77,* 51-2; 3 (Aug. 1951).

Technical limits most commonly accepted can be exceeded without a deterioration in roving quality. However, it is also readily apparent that the use of higher speeds require equipment maintained in perfect working condition and controlled and maintained by personnel willing to take the time and effort to assure this condition. To offset the added product gained there must be considered the possibility of needing to purchase more replacement parts, and the necessity of employing the type of men willing to keep a conscientious check upon all of the pertinent points which are important in producing high quality roving over a long period. Today, under highly competitive conditions of a tight market, the higher production per spindle may be highly significant, when coupled with similar moves in production speeds throughout the remainder of the mill.

Spinning B 4

Apparatus for controlling yarn tension

John K. Cochran (to The Duplan Corp.), USP 2,552,150.

A device for spinning and twisting textile yarns comprising a spindle mounted at an angle and a yarn supply cylindrical supporting tube, the tube having a plurality of notches in the cylindrical surface thereof, a yarn tension control device rotatably mounted within the tube fixed in position by a radially extending member in one of the notches, the tension control device comprising a plurality of curved rigidly mounted laterally extending fingers and a plurality of curved pivotally mounted laterally extending fingers longitudianlly interposed with the rigidly mounted fingers, and an eccentrically mounted weight attached to the pivotally mounted fingers to move therewith and to be acted on by gravity to cause the pivotally mounted fingers to interlace and laterally overlap the rigidly mounted fingers when the spindle and the control device are in operating position, the pivotally mounted fingers being in non-overlapping position when the control device is rotated substantially 180° to non-operating position, the amount of overlap and yarn tension being dependent on the selection of the notches for the radially extending member.

Art of producing yarn

Frank Honig. USP 2,557,433, June 19, 1951.

The process of twisting yarn which comprises, drafting a roving into a thin ribbon-like element under conditions wherein the element takes on an electrostatic charge, feeding the ribbon-like element into a confined space having an inner surface adapted to produce like static electrical charges on fibers rubbed against it, disassociat-

ing a majority of the fibers within the confined space by electrostatic repulsion and centrifugal force withdrawing the fibers from the confined space, and simultaneously rotating the fibers as a mass while withdrawing them, whereby the inidvidual fibers, having one free end, wrap helically about the composite yarn without receiving internal torsional stress.

Cord twister stopping means

Seddon C. Nelson (to American Viscose Corp.) USP 2,561,749, July 24, 1951.

Stopping means is associated with a dancer roll about which the yarn proceeds from a supply package to a take-up device, both of which may be twisters. The dancer roll may be carried on a pivotable arm which is held in a neutral position by springs extending from the arm in the opposite directions to fixed points on the frame of the machine. Electrical switches are so arranged with respect to the arm as to open the motor circuit when the arm swings beyond a predetermined amount in either direction from the neutral position.

Discussion on metallic and cushion rolls

Staff. *Textile Industries 115,* 171-2 (July 1951).

Tests run on plain shell rolls, ball bearing top rolls, and solid rolls showed that both types of shell rollers make a more uniform roving than common type roller. Stronger yarn resulted from the shell roller than that from common type rollers, and ball bearing top rollers showed an even more marked increase in yarn strength with less variation than either of the other types. Ball bearing top rollers are preferred by this contributor since they are lubricated only once each six months and there is less danger of oil getting in the stock.

Efficiency factors in worsted ring spinning

G. E. Sheard. *Textile Mfr. 77,* 211-15 (May 1951).

Basically, the ring spinning system consists of a hardened steel ring around which a steel traveler, or horse-shoe shaped wire, is drawn around by the spindle and the yarn. Improvements in ring spinning have mainly been in ring and traveler design and construction; and advantages include such things as larger package spinning and spinning direct onto the weaver's pirn. A discussion of the various factors in worsted ring spinning is presented, including the types of rings, types of travelers, lubrication,

self-lubricating rings, degree of tension applicable to the yarn, etc.

Hollow spinning or twisting member

Ede Hegediis. USP 2,557,104, June 19, 1951.

A device for imparting false twist to twistable material comprising a twisting member having substantially the form of a body of revolution and having a substantially axial passageway for the twistable material and a lateral slot extending the full length of the twisting member and forming a passage from the periphery of the twisting member to the axial passageway, the slot being inclined with reference to the axis of the member, means for rotatably supporting the twisting member, the supporting means having at least one open section affording free lateral movement of the twistable material therethrough to the twisting member when the latter is rotating at high speed, the adjacent surfaces of the twisting member and supporting means which are engaged by said twistable material when with the twisting member being inclined relative to one another so that rotation of the twisting member causes the twistable material to be taken by and moved into said slot.

How to reduce yarn defects

Anon. *Textile Industries 115,* 105-7 (June 1951).

Yarn defects in one mill have been reduced more than 50% in the spinning room by eliminating all blowing off of the overhead, base rails, ring rails, idler pulleys, drive pulleys, motors, and overhead cleaners. A small, round bristle brush about 1½" in diameter, mounted on a metal handle is used to clean around the spindles; a revolving picker with an extra long shaft is used to clean the idler pulleys; and motors are cleaned with a hand mop. Compressed air is only used to clean the humidifiers, and installation of a modern air conditioning system will eliminate this use of compressed air. Other spinning defects have been found to be caused by cleaning back guides with a finger brush that is too wide or used carelessly, too vigorous brushing of rails, improper piecing-up ends such as "cork screw" piecing, improper creeling of the roving, etc. Elimination of yarn defects caused in pre-spinning processes is also of importance. Use of highly napped clearer cloth on drawing and roving frames will help eliminate clearer waste, and use of the correct diameter cots will help in eliminating eyebrowing at the rolls which also causes spun-in or loose lint buttons. Proper snickplate settings

is another place where care is needed so as to avoid yarn defects. These settings can be determined by close observation of the yarn at the spoolers, slashers, and looms.

Magnetic bobbin holding means

Alfred W. Thomas, Jr. & Nicholas F. Gubitose (to U. S. Textile Machine Co.) USP 2,561,155, July 17, 1951.

A bobbin having a recess centrally located at one end thereof, a permanent magnet secured in the recess, a bearing device projectingly held in the recess by the magnet, a yarn guide spinner mounted for free rotation on the projecting section of the bearing device, a flat surface section at the other end of the bobbin provided with a central recess and means subject to magnetic attraction.

Preventing fly accumulation on spinning, etc., frames

Anon. *Textile Mfr. 77*, 237-8 (May 1951).

The Parks-Cramer travelling cleaners include two units: a down draught for cleaning exposed upper surfaces of the machine down to the roller beam and a up draught for preventing lint or fly accumulation on the ceiling and all overhead surfaces. Advantages reported for spinning frames include: improved yarn quality, increased production, reduced cleaning time, less waste, and improved working conditions. Operational details of the two units are presented.

Stop mechanism for yarn spinning machines

John K. Cochran (to The Duplan Corp.) USP 2,557,783, June 19, 1951.

A stop motion mechanism for spinning machines having a rotatable spindle having drive means and a rotatable take-up element also having drive means, comprising a roller adapted to be kept in a predetermined position by the thread or yarn being spun, and to move to a different position upon breaking of the thread or yarn, a switch coupled to the roller to be closed thereby when in different position, a slide member upon which the spindle is mounted, a brake for the spindle, a solenoid responsive to closing of the switch upon movement of the roller from the predetermined position to the different position for moving the slide member to disengage the spindle from its drive means and to engage the brake, and further means also responsive to the roller movement for simultaneously disengaging said take-up element from its drive means, whereby both the spindle and the take-up element are stopped simultaneously.

Suction device on spinning frame

H. G. Bechtler. Brit. P. 645,432. *Textile Mfr. 77*, 261 (May 1951).

Suction nozzles for spinning frames are disposed at the outlet side of the fluted rollers and each nozzle can be moved from a predetermined normal position near the rollers to a predetermined position near the rollers and to be positively located in one or other of the positions.

Support for the drawing-roll mechanisms in spinning machines

Walter Hoffman. USP 2,557,658, June 19, 1951.

In a spinning machine, spindles, drawing mechanisms, a machine frame including a horizontal bar for supporting the drawing mechanisms, at least two support walls placed transversely to and connected with said bars and adapted to rest on the ground, and supplemental rigid frame means disposed free of the ground, transversely to the bars, and between and parallel to the support walls and being also connected with the bars.

Two-zone drafting system

C. Delesalle. Brit. P. 645,066. *Textile Mfr. 77*, 259-60.

This two-zone drafting device for spinning, fly, or drawing frames effects drafting in the back zone between a fluted roller and a fluted intermediate roller. The front drafting operation is effected between two sets of aprons.

Yarn carrier

Edward Jentsch. USP 2,560,955, July 17, 1951.

A yarn carrier which includes a main body portion having a slotted opening at one end thereof, a nose portion extending from the slotted end of the main body portion, the main body portion having recessed portions adjacent the slotted opening therein, the recessed portions being shaped to fit the nose portion with a sliding fit, a clamping member located on the main body portion in opposed relation to the pose portion, the of the main body portion and fastening means engaging with the nose portion and the clamping member and extending through the slotted opening in the main body portion, the fastening means removably securing the nose portion to the main body portion and permitting lengthwise movement of the nose portion relative to the main body portion.

Yarn mill uses "throw-away" spinning bobbins

Staff. *Textile Industries 115,* 91 (August 1951).

See front section.

Winding and spooling B 5

Advancing reel

William G. Esmond (to Celanese Corp. of Am.) USP 2,558,835, July 3, 1951.

A reel for advancing helics of yarn axially comprising a bushing, a rotatable shaft journaled in the bushing, a plate mounted on the shaft for rotation therewith, a plurality of spaced angularly arranged bearing housings on the plate, a radially reciprocable block mounted in each of the bearing housings, a longitudinally extending bar, for carrying the yarn along the reel, fixed to each block, and a single stationary cam, having a plurality of grooves therein, mounted on the bushing for reciprocating each of the blocks in the housings individually and in predetermined order.

Automatic pirn winder

W. H. Frost. Brit. P. 645,274. *Textile Mfr. 77,* 260 (May 1951).

A pirn winder fitted with an automatic bobbin change mechanism comprises a cam supported lever pivoted to a lug on the box of the yarn measuring device and is provided with a catch that works in conjunction with a stepped cam. The cam supported lever has an extension from which is suspended an arm formed with a slot for a screw that is screwed into one arm of a two-armed lever. This lever is freely mounted on a rod which is adjustably fixed in a bracket that is also adjustably fixed on a rod which forms part of the automatic pirn winder. Attached to the screw is a tension spring, the other end of which is attached to another screw fixed to the arm suspended from the cam supported lever. The other arm of the two-armed lever has an adjustable extension rod and suspended from it is a rod on which is fixed a weight. The end of the suspended rod passes freely through a hole in one arm of an oscillatory lever. The other arm of this lever has a slot through which a movable rod which is the permanent operating rod for the pirn changing mechanism.

Textile guide ring

Arthur R. Benson (to The W. W. Mildrum Jewel Co., Inc.) USP 2,557,591, June 19, 1951.

In a guide for a longitudinally moving thread, a ring having a pair of end portions defining a

transverse slot for the admission of the thread thereto, and a thread-retaining element in the form of a loop extending across the slot inwardly of the line of the outer periphery of the ring and spaced from one of the end portions, a tubular stem, the ring being rigidly secured to the stem adjacent the other of the end portions, the thread-retaining element having its ends rigidly secured to opposite sides of the stem adjacent the other of the end portions, whereby a thread may be passed laterally between the ring and the retaining element adjacent the first end portion, and into the ring.

Yarn advancing reel

William G. Esmond (to Celanese Corp. of Am.) USP 2,558,836, July 3, 1951.

In a reel for advancing helics of yarn axially, having a rotatable shaft, a plurality of axially extending bars for carrying the yarn along the reel rotatable by the shaft, means for reciprocating the bars and a drum, having an opening through which the bars extend, and an opening through which the shaft extends, angularly movable with the bars for housing the bar reciprocating means, the improvement which comprises means for sealing the drum against the entrance of fluids, the means including a rubber gasket attached to and movable with the drum for substantially closing the first-mentioned opening in the drum, the rubber gasket having openings therein through which the bars protrude, and telescoping flanges for sealing the second-mentioned opening.

Yarn processing B 6

Liquid treatment of yarns

Brit. P. 645,171. Courtaulds Ltd. *Textile Mfr. 77,* 260 (May 1951).

Apparatus for the liquid treatment of threads, fibers, filaments, etc. consists of a roller, on the surface of which liquid treatment is to be effected. The surface of the roller is divided into at least one liquid treating zone and a boundary zone the surface of which is not wetted by the liquid. The liquid supplied to the treating zone will not normally pass across the surface of the boundary zone.

Thread-treating apparatus

Arthur Cresswell (to American Cyanamid Co.) USP 2,558,734, July 3, 1951.

Apparatus for contacting a continuously moving thread with a liquid, the apparatus comprising a vessel having a bottom portion and side and

end portions, each of the end portions being provided with an opening adapted for the passage therethrough of the moving thread; a trough-like member positioned within the vessel, the member being spaced from the end portions and being aligned with the openings therein, and the walls defining the trough-like member being provided with a plurality of spaced apertures extending longitudinally from one end to the other end of the member; inlet reservoir means beneath the trough-like member; means for introducing a liquid to the inlet-reservoir means; and means for withdrawing liquid from the vessel after its passage through the apertures of the trough-like member.

Yarn testing and numbering B 10

Figure evenness by machine or planimeter

Rolph A. Rusca. *Textile Industries 115*, 79-81, 178 (July 1951).

Test conditions used at the Southern Regional Research Laboratory in the evaluation of the effect of atmospheric conditions on the operation of the Uster yarns evenness tester are described, and a description of the tester is given. Methods used to treat statistically the recorded strip charts of the tester were the polar planimeter and the method of plotting the high and low percentage points. Results showed that minor fluctuations in relative humidity and temperature in these tests did not significantly affect the measurements of long-term variations in product uniformity but had some effect on the measurement of short-term variations. In a comparison of results obtained by the planimeter and percentage techniques, significant differences agreed in 5 of the 6 conditions investigated, but the percentage technique was favored because the test results could be determined quickly and with the least effort.

FABRIC PRODUCTION C

Yarn preparation C 1

Beaming apparatus

Ernest K. Bauer and William H. Newton (to American Viscose Corp.) USP 2,558,033, June 26, 1951.

In a beam warper of the type having a warp control means between a source of warp supply and a selectively driven warp beam, said warp control means comprising a first set of rolls having fixed axes, a second set of rolls, a carrier for

the second set of rolls, the carrier being mounted for movement between an upper position in which warp passing between the two sets of rolls is untensioned thereby and a lower position in which the warp is drawn into loops of substantial length, and the movement from the upper to the lower position involving a gravity descent of the carrier, the carrier being normally releasably held in the upper position, means for releasing the carrier for initial descent to an intermediate position followed by gravity descent to the lower position, means whereby the carrier may thereafter be automatically elevated to the intermediate position by the pull of the warp thereon, and clamping means for the warp between the source of supply and the sets of rolls for automatically clamping said warp while the carrier is lowered and for releasing the warp incident to the elevation of the carrier.

Continuous flow of uniform size to slashers available with hydropulse unit

Staff. *Textile Industries 115*, 73 (July 1951).

The Scott & Williams Hydropulse unit consists of a heat exchanger and a high pressure homogenizer designed to work in tandem and designed to give continuous and uninterrupted preparation of warp sizing so that fresh size is continuously available for the slasher. In addition, there is no waste of sizing material, no varying dilution due to live steam condensation, lower steam consumption, increased wearing efficiency, etc.

Ion-free water aids throwing plant in sizing nylon

Staff. *Textile Industries 115*, 88-90, 192 (July 1951).

Water of the highest purity is needed in formulating polyvinyl alcohol and polyacrylic acid base sizing solutions for sizing monofilament nylon yarn because perfect sizing solutions cannot be formed with anything less than ion free water. The viscosity of sizing solutions, which is dependent on the nature of the water used, must be kept constant and uniform throughout the sizing operation. At the Kahn & Feldman, Inc. throwing plant demineralization of water is accomplished by the use of a Filt-R-Still which is a 4-bed unit with the beds alternately containing cation and anion exchange resins. Instruments and controls include a Rotameter for measuring flow rate, a pressure gauge, and an electronic controller equipped with red and green light indicators for measuring the resistance of water leaving the last bed. Yield of the Filt-R-Stil is said to be as little as one

part-per-million total ionizable solids from 500 to 1000 ppm water. Cost of the resin treated effluent is considerably less than comparable distilled water with 100 ppm water being treated for about 7 cents per 1000 gallons.

Sectional warping frame

Henri Crouzet. USP 2,557,597, June 19, 1951.

A moveable warp frame comprising parallel rails, a system including a carriage, a head piece secured to the carriage and guided over the rails, swivelling wheels supporting the carriage and adapted to run over the rails and also in every direction over a horizontal surface, a stationary rack parallel to the rails, a pinion carried by the head piece and engaging the rack, power means carried by the head piece and controlling the pinion for providing the progression of the head piece and carriage system, a rotary drum supported by the carriage and including a conical part operative for thread winding and adapted to rotate round an axis parallel to the axis of the carriage, means whereby the power means on the head piece are adapted to control the rotation of the drum round its axis with a predetermined speed relationship with reference to the speed of progression of its carriage, a creel the axis of which is perpendicular to the rails, means for feeding warp threads from the creel to the rotary drum during its double rotary and translational movement and a reed in front of the creel adapted to engage the warp threads before they engage the drum.

Weaving C 2

Automatic shuttle changer for double fabric looms

Bernard J. M. A. Delaroiere (to Delaroiere & LeClerq) USP 2,560,687, July 17, 1951.

In a double cloth weaving loom of the type used for producing velvet and plush, the combination of a batten, a series of three superposed shuttle boxes on one side of the batten of which two contain shuttles that are operative at a time and means whereby the substantial exhaustion of the lower shuttle provides for the introduction of a fresh shuttle into the third box and the ejection of the last mentioned operative shuttle when exhausted shuttle of the previously operative two shuttles considered and a horizontal cross member for the batten provided throughout its length with a channel for the ejected exhausted shuttle.

Axminster fabric

Philip Miller (to Alexander Smith & Sons Carpet Co.) USP 2,557,452, June 19, 1951.

An Axminster pile fabric comprising groups of double weft shots, stuffer yarns and chain yarn forming a woven backing and rows of pile tufts bound in the groups of weft shots, the fabric having warpwise aligned portions in which the pile consists of yarn so highly twisted that it would cockle or coil if relaxed and being set in straight uncockled form by treatment equivalent to steaming in a closed vessel with saturated steam at elevated pressure until the twist has set so that the yarn retains its straight hard twisted form when the tension is relieved, the yarn being formed into U-shaped pile tufts having uncockled vertical legs with cut ends uniformly disposed over the surface of the fabric and having low covering power to produce a pebbly appearance, the portions being separated by other portions in which the pile consists of U-shaped pile tufts consisting of low twist yarn having high covering power, the pile tufts all being of the same height and being disposed in different area selected to conform to a predetermined pattern.

Bobbin control for loom batteries

Staff. *Textile Industries 115*, 181 (July 1951).

The UGO bobbin control, which can be easily applied to the loom battery, holds filling bobbins high-up in the disc and in perfect alignment so that transfers are made without filling breaks and the shuttle is properly threaded. Mfr: Royal Textrol Co.

Construction of "Wilton" carpets on the double-piece double-shuttle principle.

J. Cowburn. *Textile Mfr. 77*, 272-4 (June 1951).

Plain Wilton body, or fitted carpets have been popular for many years and no doubt will always have an appeal to some sections of the public because, in the first place, a plain good quality carpet provides a sound basis upon which to build a furnishing scheme for a room. Secondly, there is little danger of cutting to waste as is the case with a patterned fitted carpet and, thirdly, for the same depth and density of pile and quality of materials, a plain carpet will always be cheaper.

Plain body carpets of the Wilton type are produced on sturdily constructed looms specially built for the purpose, but basically the same as those looms used for the manufacture of moquettes. Provision is made for two sheds to be formed and for two shuttles to be propelled across the loom at the same time, one through the upper

shed and one through the lower.

Exploiting design possibilities

Abd. El. Latif Maamoun Bayoumi. *Textile Recorder 69,* 94-6 (May 1951).

To demonstrate the wide range of interesting and attractive fabrics that can be produced on Lancashire looms, construction details together with photographs and design patterns of a number of fabrics woven on Lancashire looms are presented. Alternative designs on similar lines are also suggested.

Forty-nine cloth defects — and what may cause them

S. C. Veney. *Textile World 101,* 113-18 (Aug. 1951).

Charts list most cloth defects common in weave rooms and indicate remedies in weaving, warping, quilling, slashing, winding or throwing.

Geometrical designs for dress and tie, etc., fabrics

A. L. Mamoun Bayoumi. *Textile Mfr. 77,* 265-7 (June 1951).

Geometric planning in textile design provides an unlimited scope for producing designs by the combination of various forms. But to insure a unity of effect, the designer should carefully consider in detail at an early stage how the pattern will join side to side and top to bottom.

Pattern is essentially repetition reproduction, and designs, whether printed or woven, consists largely of mechanically repeated units which are relatively only a small portion of the total area. The object of pattern is to endow interest and improve surface appearance. Photographs of 15 fabrics are shown, revealing the use varied geometrical units such as squares, rectangles, etc. and their combination with abstract design.

Heddle control for looms

Patrick A. Whitaker. USP 2,558,284, June 26, 1951.

A heddle control for looms having warp threads and separate heddle wires connected to elevate each warp, the control comprising a cylinder block extending across the loom above the warp threads and having a flat upper surface and a separate vertical cylinder extending through the block from the upper surface and disposed approximately in registration with each warp thread, a piston in each cylinder, one of the heddle wires being connected to the bottom of each piston, a suction head above the cylinder block having a flat lower surface conforming to

the upper surface of the block with a suction opening therein registering with the top of each cylinder, and a control sheet disposed between the block and the suction head to close the passages to the cylinders, and having perforations registering with selected cylinders for the control of suction thereto.

Loom harness

John Jacob Kaufmann (to Steel Heddle Manufacturing Co.) USP 2,560,512, July 10, 1951.

In loom harness including a heddle having top and bottom rails, end struts connecting the ends of said top and bottom rails, heddle supporting rods comprising thin flat metallic straps removably mounted in the frame, heddles mounted on the rods, and means for supporting the rods intermediate the end thereof, the means for securing the heddle supporting rods in the frame comprising the provision of apertures in the heddle supporting rods near each end thereof, the apertures each having a wide portion and a narrow portion, spring tongues mounted on the inside faces of the end struts, the spring tongues each having a recess adapted to receive and support an end portion of a heddle supporting rod and a member disposed in the recess a portion of which through the wide portion of the aperture at the end of the heddle rod and a portion of which is adapted to be seated in the narrow portion of the aperture thereby to lock the heddle supporting rod in the frame.

Loom let-off motions

H. Gardner. Brit. P. 645,471. *Textile Mfr. 77,* 261, (May 1951).

A loom let-off motion has a spring acting through a compensating member on friction ropes, chains, etc., on the ends of the beam so that equal friction is applied at the two ends of the warp beam to tension the warp. The spring is adapted to have its tension finely adjusted durthe working of the loom and quickly released when required.

Multiple Cylinder dobby attachment

Staff. *Textile Industries 115,* 182-4 (July 1951).

A multiple cylinder dobby attachment, invented by Ivar O. Moberg of Spray, N. C., can be applied to any dobby or Knowles head motion without interfering with the conventional running of these harness motions. The attachment, developed for production of electric blankets and sheets without the use of Jacquard head, is said

to be equally useful for fancy border blankets, table cloths, bed spreads, fancy curtains, etc. It consists of a revolving magazine holding 6 or 8 aluminum pattern cylinders which are driven by a planetary gear motion and which revolve around their own axis as well as moving intermittently around in their orbit when called upon to do so. Each cylinder carries its own complete weave, or all the cylinders may be combined to produce a fancy weave. The change from one weave to another is said to be a matter of minutes. All cylinders revolve in unison, eliminating danger of mispicks.

New loom reed has magnesium ribs

Staff. *Textile Industries 115*, 181-2 (July 1951).

A new loom reed has dents of either carbon or stainless steel with the ends of the dents held securely by strong aluminum or magnesium ribs. The end bars are riveted in place between each pair of ribs and do not require reed caps. This special "Rigid Reed" construction is reported to give the reed lightness and resiliency with some of the stiffness and strength of an all-metal reed. Mfr: Emmons Loom Harness Co.

New selvedge trimming machine

Anon. *Textile Mfr. 77* 276, (June 1951).

See front section.

Pile fabric loom

Stewart McKnight (to Mohawk Carpet Mills, Inc.). USP 2,559,507, July 3, 1951.

In a loom having a frame including a pair of sides formed to provide a support for a warp beam, the combination of a plurality of harnesses, harness operating means including pairs of vertical supporting elements, the elements of each pair having their lower ends connected to a harness and the means being operable to raise and lower the pairs of elements and the harnesses depending therefrom, tension means mounted on the frame for applying tension to warp yarns on their way from the beam through the harnesses, and means mounted on the loom frame for guiding warp yarns from the beam upwardly at the rear of the elements, over the upper end of the harness operating means downwardly in front of the elements, and through the space immediately above the harnesses to the tension means.

Primary aspects of the power loom

W. Middlebrook. *Textile Mfr. 77*, 268-70 (June 1951).

A brief review of the preliminary operations

in the preparation of warp and weft, and the principles of warp let-off in the loom. The fundamental principles of weaving remain, but the primary motions of warp let-off, shedding, picking, beat-up and take-up of the earliest power loom are still the governing factors without which a cloth cannot be made. However intricate the loom, therefore, a sound understanding of these basic principles is the first step towards its mastery by the conscientious fixer. The secondary motions added since the invention of the first power loom have been all intended as aids to the weaver and not essential to the production of many fabrics; these secondary motions include such things as weft and warp-stop motions, weft-feeler motions and temples, and do not come within the scope of the present work.

Reed cap support for heavy looms

T. Hindle. Brit. P. 645,578. *Textile Mfr. 77*, 261 (May 1951).

Means for supporting the reed-cap on wide and heavy looms comprises the sley firmly bolted to the intermediate sword. The bottom baulk of the reed is clamped to the sley by the reed-clamp and bolts, and the top baulk fits into a tapered groove formed in the reed cap. The intermediate sword is provided with means for supporting the reed-lap so as to resist deflection when the reed beats up the weft. The reed-cap is bolted to the end of a lever which is pivoted about midway in its length on a pin carried in lugs formed integrally with or bolted to the sword behind the sley. The upper arm of the lever projects through the warp yarn and the top end of the lever has slotted ears by which it is rigidly secured to the reed-cap. The lower arm of the lever extends below its pivot pin into a recess formed in the intermediate sword and adjusting screws are provided to rock the lever forward or backward to lock it firmly into position when the reed and reed-cap are correctly aligned.

Shuttleless loom

Arthur S. C. Hart. USP 2,552,317, May 8, 1951.

In a loom having a warp shed changing mechanism, a beat up mechanism and a weft inserting arm operative from one side of the warp to insert a weft thread into successively formed warp sheds in the form of double picks, the warp shed changing mechanism, beat up mechanism and weft inserting arm being operated in timed relationship; means for operating the arm and for inserting a selvedge thread through the double

picks at that side of the warp opposite that at which the arm is operative comprising a main drive shaft, a cam driven from the main drive shaft, a rack bar to which a reciprocatory motion is imparted on operation of the cam, a pinion associated with the weft inserting arm and cooperating with the rack bar so that on reciprocation of the latter, an oscillatory motion will be imparted to the arm to project the same back and forth through the warp, a stationary frame disposed at that side of the warp opposite to that at which the weft inserting arm operates and having a slot through which the arm is adapted to pass on projection through the warp, two rods supported on the frame in axial alignment and one at either side of the slot, a carrier element slidably supported on either of the rods and adapted to carry a supply of selvedge thread, rack teeth on the carrier, a pair of pinions rotatably supported on the frame and disposed one adjacent each rod so that each pinion will mesh with the teeth on the carrier element when the latter is supported on the adjacent rod, a rack bar slidably supported with respect to the frame and adapted to mesh with the pinions and means driven from the main drive shaft and adapted to effect reciprocation of the bar in timed relation with the weft inserting arm so that on movement of the bar in one direction or the other the pinions will be driven to effect movement of the carrier element from one rod to the other and thereby to cause the selvedge thread to be passed through the bight of each double pick.

Side slipping weft detector

Clarence R. Kronoff and George N. Peterson (to Crompton & Knowles Loom Works) USP 2,557,548, June 19, 1951.

In a weft detecting mechanism for a weft replenishing loom having a weft surface to be detected, a support fixed with respect to the loom, a detector lever pivoted on the support, a guide on the lever extending in a direction toward and from the surface, a detector finger slidable on the guide and having a feeler tip offset from the axis of the lever in the direction of the length of the surface, means indicating weft exhaustion when the lever moves angularly on the support, a lateral arm on the finger, a retractor operative on a weft replenishing operation of the loom to engage the arm and move the finger on the guide in a direction away from the surface, and a spring having one end thereof fixed with respect to the support and having the other end thereof connected to the lateral arm between the guide on the lever and the retractor, the spring, finger and guide effective during movement of the finger by the retractor to prevent angular motion of the latter.

Stop motion for narrow fabric looms

James G. Corl (to Royal Swan, Inc.) USP 2,557,533, June 19, 1951.

In a loom adapted to weaving fabrics and having shuttles which move transversely with respect to the longitudinal axis of the fabric being woven as well as longitudinally thereof, in combination means for projecting a beam of light transversely of the longitudinal axis of the fabric being woven, light sensitive means actuated upon interruption of the light beam to control a drive motor for the loom, and means mounted on each shuttle so as to interrupt the light beam upon breakage of the filling yarn or loss of tension therein.

Studies in textile design. IX — Hopsack and mat effects

Anon. *Textile Recorder 69*, 89-90 (May 1951).

The true hopsack weave is a derivative of the plain weave, being simply an enlargement of it. For example: a two-and-two hopsack is a plain weave working two threads and picks as one. There are many varieties of the design, and a hopsack may also be combined with other weaves. As illustrations, design patterns and photographs of various fabrics are given, including two different cloths based on the two-and-three hopsack weave, a piece-dyed squarely constructed fabric using the three-and-three hopsack weave, a specialty fabric of the yarn dyed worsted type with a raised finish in which the dark stripe is worked on a 3 and 1 warp twill and the ground is a two-and-two hopsack, an all-worsted coating fabric which has a fancy mat weave, and a novel check style in a two-and-two hopsack weave using light and dark yarns in warp and weft.

Suggestions offered to remedy jerked-in filling on box looms

Anon. *Textile Industries 115*, 167, 169-70 (July 1951).

Three different devices are described to eliminate jerked-in filling on box looms. Boxing the shuttle properly is reported by one contributor to keep jerked-in fillings to a minimum, and another contributor suggests that checking for excessive twist in the filling will help in eliminating this trouble.

Tension apparatus for loom warp yarns

Thomas J. Willis and William A. Smith. USP 2,551,920, May 8, 1951.

In a loom having a lay and cloth take-up means adjacent the lay and also having a whip roll and a warp beam and warp yarns directed from the warp beam over the whip roll and to the lay for weaving the same into cloth, the loom also having a shipper handle thereon, an eccentrically mounted pressure roll extending transversely of the loom and being oscillatable on the axis of its eccentric mounting, a lever arm connected to the eccentric mounting at its axis, a solenoid coil carried by the loom and disposed below the lever arm, a solenoid plunger in the solenoid coil, a connection between the solenoid plunger and the lever arm, means electrically and automatically energizing the solenoid coil to thus cause the plunger to be drawn into the same and to move the pressure roll relative to the warp yarns to increase the tension thereon, and means automatically operable upon moving the shipper handle to an inoperative position for releasing the solenoid plunger to permit the pressure roll to move away from a pressure applying position relative to the warp yarns.

Thread controlling means for weft replenishing looms

Alexander C. Krukonis (to Crompton & Knowles Loom Works) USP 2,552,099.

In a weft replenishing loom, pneumatic thread remover means, pneumatic thread holder means, and thread cutting means, the loom having a thread extending into the holder means and remover means and pneumatically drawn against the thread cutting means by cooperation of the pneumatic means, thereby causing the thread cutting means to sever the thread, whereupon each pneumatic means draws thereinto that part of the thread extending therefrom to the thread cutting means.

Knitting C 3

Army ski sock machine

Staff. *Textile Industries 115*, 185 (July 1951).

An automatic 5″ 60-needle 10 gauge knitting machine, made by Scott & Williams, Inc., is said to make a heavy weight sock with terry stitch throughout, selvedge edge, special heel gore extending into the instep, and added gusset ahead of the toe.

Form for examining and finishing stockings

Max Kohlsdorf. USP 2,561,210, July 17, 1951.

A device comprising a pair of side plates having substantially leg-shaped profile, spacing means separating the two side plates, a stretcher side plate also having substantially leg-shaped profile positioned between the two side plates and slidable outwardly from between the two side plates, the stretcher plate having a recessed portion and transverse slots in the portion, an operating member received in the recessed portion, and slidable longitudinally relative to the stretcher slide plate, the operating member having longitudinal slots and diagonally extending cam surfaces, cam follower members extending from the stretcher plate into engagement with the cam surfaces, collar carrying bolts extending through the transverse and longitudinal slots, a pivotally supported manipulating lever and pin and slot engagement means between the lever and the operating member for sliding the operating member.

Hosiery package

Douglas Hahn (to B. Altman & Co.) USP 2,561,112, July 17, 1951.

A cylindrically-shaped hosiery package composed a pair of stockings and a wrapper of smooth, transparent material formed into a roll, and a cylindrically-shaped container for the roll, the container including a unitary sheet of relatively non-stretchable material having its longitudinal edges secured together to form a tubular body portion of fixed diameter, the body portion having a length such that its ends project slightly beyond the ends of the stocking roll enclosed thereby and having opaque end sections of substantial width to conceal the end portions of the stocking roll and being transparent intermediate the opaque end sections to expose to the view of an observer the intermediate portion of the stocking roll.

Hosiery size gauge

Lurelle Guild & Russel K. Boadwee (to Julius Kayser & Co.) USP 2,558,846, July 3, 1951.

A meter comprising a substantially triangular base, a pillar projecting upward from the base adjacent to one corner thereof, a reel connected with the base adjacent to a second corner thereof, a guide connected with the base adjacent to a second corner thereof, a guide connected with the base adjacent to a third corner thereof, an oscillatory shaft concentric with the pillar and having an arm projecting therefrom above the base and a second arm projecting therefrom below the base, a rod slidable along the shaft, a connector con-

necting the rod and reel and operatively associated with the guide and the second arm, and an indicator moveable by the connector, the connector being movable by the movement of the second arm.

Knitting elastic yarns

Brit. P. 645,063, Hemphill Co. *Textile Mfr. 77*, 259 (May 1951).

A mechanism for knitting machines is claimed for incorporating elastic yarn and producing a selvedge in which elastic is incorporated with a non-elastic yarn.

Knitting machine

Albert L. Oberholtzer (to Scott & Williams, Incorporated) USP 2,557,137.

For a knitting machine having two coaxial superposed needle cylinders and needles adapted to be transferred from one cylinder to the other, a needle leveler adapted to be positioned above the needles when in the lower cylinder and means for raising the needles into contact with the leveler whereby all needles so raised will be positioned at the same level.

Knitting machine

Jose J. Pares & Salvador S. Daroca. USP 2,560,872, July 17, 1951.

A knitting machine comprising a reciprocating grooved needle having a shank with an inclined plane terminating in a hook, the open end of the hook being in alignment with the bottom surface of the groove in the needle, in combination with a hook-shaped sinker independent of the needle having a reciprocating movement of smaller amplitude than the movement of the needle, the hook of the sinker extending into the groove of the needle in order to engage a mesh formed on the needle and withdraw it thereform to permit the formation of a new mesh by the needle and then release the first mesh and allow it to be cast off and the needle and the hook sinker are arranged substantially at right angles to one another.

Knitting machinery at the Leipsig Fair

Anon. *Textile Recorder 69*, 96 (May 1951).

A report on some of the interesting knitting machinery featured at the Leipsig Fair in Eastern Germany is given. Included are such machines as the FSW-1 full-fashioned knitting machine, the "Ideal" links-links double-cylinder machine, a jacquard warp knitting loom with bearded needles, etc.

Method and apparatus for use in knitting

Josephine P. Mecklenburger. USP 2,558,974, July 3, 1951.

The method of measuring progress in the production of a knitted product comprising the progressive attachment of a flexible tape at successive spaced points to the completed portion of such product as such product is being knitted.

Method of knitting girdles

George Lacks. USP 2,560,580, July 17, 1951.

A method of making girdles, the method comprising knitting reciprocatingly over a row of needles and thereby making one lateral half of a girdle from a bottom line to a top line, gradually reducing the width of the half girdle during the knitting by idling needles positioned at ends of the row successively, keeping the last mesh knitted on each idled needle in engagement with the needle, then making the other half of the girdle by continuing knitting reciprocatingly from the top line to a bottom line, gradually widening the other half girdle during the continuing knitting by re-activating the idled needles in a succession reverse to the succession in which they were idled, thereby engaging the meshes kept on the temporarily idled needles whereby parts of the two half girdles are united into a circularly closed piece, and cutting through the top line.

Method of manufacturing warp knitted fabric

Franitsek Stolle and Hermann Stolle (one-third to Antonin Pejsek) USP 2,557,482, June 19, 1951.

A method of manufacturing a warp-knitted fabric having elastic and non-elastic portions on a warp-knitting machine having two needle bars, one of the bars having a continuous series of latch needles and the other having latch needles arranged in zones to co-operate with the needles of the first-mentioned needle bar and separated by spaces without needles, so that within the spaces the fabric is only knitted by needles of the first-mentioned needle bar, the method comprising the steps which consist in supplying separate groups of warp threads to the needles of the respective zones and to the needles of the first-mentioned needle bar located in the spaces between the zones, inserting at least one non-elastic weft thread during the knitting of the fabric in the courses knitted by the needles located in at least one zone, so as to extend in a straight line in the respective courses, and inserting an elastic weft thread during the knitting of the fabric in the courses knitted by the needles located in at

least one of the zones, so as to extend in a straight line in the respective courses.

Narrowing and widening on circular knitting machines

Brit. P. 645,460, Hemphill Co. *Textile Mfr. 77*, 261 (May 1951).

A knitting machine of the circular independent needle type is provided with a pick having a recess in it for receiving needle butts. Adjustable means in the recess limit the number of butts which may be received in the recess at one time. The recess may also include adjustable means out of range of short butts and adapted to exclude long butts from the recess.

New model large diameter circular knitting machine

Staff. *Textile Industries 115*, 188 (July 1951).

The "Multiplex", style RM-RB machine of H. Brinton Company is a 16-feed, revolving cylinder, dogless machine for 1 x 1 plain rib or 2 x 2 rib underwear. It has a magnetic clutch, job control, horizontal space saving hand wheel, needle detector, and inserted wall cylinder and dial.

Nylon verge plates tested

Staff. *Textile Industries 115*, 91 (July 1951).

Tests on the use of regular knitting machine verge plates fitted with nylon inserts on 51-gauge full-fashioned hosiery machines at Durham Hosiery Mills indicated that nylon inserts have a longer life than regular inserts in verge plates. In 4 months of operation on two different machines, the nylon verge plates showed no signs of wear. Tests are now being conducted to show just how much longer life the nylon inserts have.

Stitching device

Charles L. Mollis. (USP 2,558,873, July 3, 1951.

A stitching device comprising a frame, a needle attached to the frame, the needle having a groove along one side and an eye adjacent its point; the frame having means for guiding a thread from a source of supply to feed thread through the needle groove and eye under a force exerted through the thread alone during the formation of the successive stitches; a thread looper including a head extending transversely of the needle between its ends, and mounted on the frame for a movement lengthwise of the needle under a force exerted through a fabric penetrated by the needle; and yieldable means for urging the head to a forward position on the needle and toward the eye upon the removal of the force ex-

erted through a penetrated fabric, whereupon the length of thread along the needle exterior of the groove is formed into a loop adapted to be retained by the user upon the needle being withdrawn.

Straight-bar knitting machine

Brit. P. 645,486, Dexdale Hosiery Mills. *Textile Mfr. 77*, 261 (May 1951).

A fine gauge straight-bar knitting machine of the "cotton" type has needles with plain short rigid hooks and separately actuated co-operative beard points. These beard points not only perform the functions of the usual needle beards, but also control the yarn to insure its being taken by the end needles to make certain the formation of perfect selvedges. During stitch formation the beard points are interposed between the needles and the presser ledge and are buttressed by the ledge as the needles are lightly pressed against them. Actuating means are also provided to reduce to a minimum the period of sliding contact of the points with the ledge during each stitch forming cycle.

Three-color stripper spring needle machine

Staff. *Textile Industries 115*, 187 (July 1951).

The spring needle knitting machine of Tompkins Bros. Company has a new type color drum and a pattern changing mechanism which throws jack pressers in and out of action, converting from pattern work to plain jersey. Inserts, slipped into a simple color drum determine color selection.

Type TEAM circular rib knitter

Staff. *Textile Industries 115*, 189 (July 1951).

A circular rib outwear machine, displayed at the Knitting Show by Edmos Products Co., may make patterns, which may be altered quickly by changing cams, as well as plain rib fabrics. Single-butt and double-butt needles are used in conjunction with the cams, and a calibrated dial and single control to raise or lower the dial permits a quock change of stitch.

Warp knitting on latch needle machines. I — The knitting of raschel fabrics

J. B. Lancashire. *Textile Recorder 69*, 91-3 (May 1951).

Of the latch needle warp knitting machines, the Raschel type is the most common and is a straight-bar loom with vertical needles. It has two needle bars which are given vertical movements from separate sets of cams, and a stationary comb bar with fixed knocking-over bits at its

upper end is provided for each needle bar. The fabric is drawn off downwards between these comb bars by an adjustable mechanism. Products of the Raschel loom which are discussed include double rib fabrics, warp-knitted crepe, selvedging, warp-knitted plush, fancy rib laps, fabrics knitted on one needle bar, the use of laid-in threads, fabrics incorporating fall-plate laps, a shawl border fabric, and elastic fabrics.

Yarn feeding mechanism for knitting machines

Albert Matthews Brown (to G. Stibbe & Co. Ltd.) USP. 2,561,175, July 17, 1951.

In yarn feeding mechanism of the type herein referred to for a knitting machine, a yarn compensator comprising, in combination, a central fixed spindle, a member arranged to rock about the spindle, an upwardly directed arm on the member which arm is provided with a guide for a running yarn, a second arm which depends from the rocking member and is provided with at least one further guide for the yarn, a disc fixed on the spindle, and a damping element which is mounted on the rocking member and adapted for co-operation with the fixed disc in such a way as to damp the oscillations of the rocking member and thereby counteract any pendulum effect thereof under changes in the tension of the yarn running through the aforesaid yarn guides.

Yarn take-up device for knitting machines

Brit. P. 645,388, Hemphill Co. *Textile Mfr.* 77, 260 (May 1951).

This yarn take-up device for knitting machines includes a pivoted take-up arm with a resilient member for applying a force tending to swing the arm about its pivot. The resilient member has an end in variable leverage relation with the arm but being unvarying in length during swinging movement of the arm.

Special fabrics C 4

Fibrous glass fabric

Anna S. Tallman to (Owens-Corning Fiberglas Corp.), USP 2,552,124.

As a product of manufacture, a fabric comprising a laterally stretchable sheet of glass fibers with the fibers arranged in parallelism with each other along their lengths with the individual fibers extending substantially continuously throughout a major dimension of the sheet, a relatively thin web of haphazardly related interlaced glass fibers overlying a face of the sheet, the fibers of the web being about one-seventh to one-half the diameter of the fibers of the sheet, and

a binding material distributed through the sheet and web and bonding the fibers together.

STANDARD FINISHING D

Centrifugal separation

F. H. Slade. *Textile Mfr.* 77, 218-22, 225 (May 1951).

Technically speaking, centrifugal separation involves subjecting materials to centrifugal force and thus effecting functions of liquid-liquid separation, liquid-liquid-solid separation, and liquid-solid separation. The machines used for centrifuging include: (1) centrifugal separators designed for purification of liquids, separation of liquid mixtures, and recovery of suspended matter from liquids; (2) centrifugal machines for use in dealing with crystalline and granular materials, and (3) hydro-extractors. In the textile industry, centrifugal separators are used for such purposes as purification of mercerizing lye and in the recovery and purification of wool grease. Centrifugal machines are used in two of the processing stages of cellulose acetate powder, for drying sodium sulfate crystals produced in the crystallization of the spent fixing bath in the rayon industry, etc. The hydro-extractor is used in textile mills, bleach works, carpet mills, etc., for mechanical drying of textile and fibrous materials. Descriptions of these 3 machines and their operation are presented.

Crease-removing apparatus

C. H. Turner. Brit. P. 644,987. *Textile Mfr.* 77, 259 (May 1951).

A list opening apparatus, which removes crease folds from selvedges or edges of material so that they can be fed flat to an adjacent machine, has at least two adjacent blades arranged in staggered parallel relationship so that the material passes over one blade and then under the next. The blades may be parallel in different vertical planes with their edges overlapping, may be set at any angle across the direction of feed, and may be spring loaded to allow the joints of material to pass between the blades.

Drying in the textile and allied industries

R. R. Clegg. *Textile Mfr.* 77, 223-5 (May 1951).

The type of drier used in drying textiles depends on the nature of the stock to be handled. Thus, for loose stock a batch drier is used when the output is small, and a continuous type conveyor drying machine is used when the output

is large. The equipment required with loose-form stock, packages, rayon cakes, and skeins and hanks are described; and radio-frequency heating, conduction driers, and convection driers are discussed.

Good plant design can cut finishing costs

E. C. Gwaltney. *Textile World 101*, 143, 145, 188 (June 1951).

Building design should fit the process, not the shape of the property. Use of newer materials, such as hollow tile, can keep cost down. Waste can be mixed to eliminate many disposal problems. Cost of continuing maintenance should influence initial choice of materials.

Topics discussed: site, type and volume of goods, better materials, long-term upkeep, floors, air requirements, steam. (Paper presented at meeting of Textile Section, American Society of Mechanical Engineers in Atlanta, Ga.).

Hammer mill with concentric screens for separating varied sizes of finished materials

Polychronis A. Emmanouilidis (twenty-five per cent to John P. Pandazides) USP 2,557,-865, June 19, 1951.

In a hammer mill, the combination of a housing comprising upper and lower sections having respective lower and upper contiguous edges thereof separably secured together, a pair of coaxial bearings mounted exteriorly on opposite sides of the lower housing section and having their axis disposed in the plane of the contiguous edges, a rotor mounted in the housing and including a transverse shaft rotatably journaled in the bearings, the bearings including removable upper caps whereby to permit removal of the rotor and shaft when the housing sections are separated, a set of horizontal traps secured to the upper edge portion of the lower housing section and disposed at the opposite side of the rotor in the plane of the contiguous edges, and a plurality of foraminous stationary separating cylinders provided in the housing and surrounding the rotor in spaced concentric relation, each of the cylinders comprising upper and lower half sections having opposite ends thereof removably secured to the straps at respective opposite sides of the rotor.

Mechanics of wool felting

R. W. Moncrieff. *Textile Mfr. 77*, 242-5 (May 1951).

Shrinking and felting will not take place unless the fiber possesses a scale structure and unless there is agitation and moisture. Other conditions which contribute to felting are: ease of extension and deformation; power of recovery from extension and deformation; curl and crimp, length and fineness of the fiber; warmth; and acid or alkaline state of milling liquor. The mechanics of the process are diverse and varied with wool fibers behaving in different ways simultaneously during milling rather than in any one particular way (See also *TTD 8*, 374).

New British cloth shrinkage machine

Anon. *Skinner's Silk & Rayon Rec. 25*, 1032 (Aug. 1951).

Though for the present the Emerson Cloth Shrinking machine is mainly concerned with wool textiles, it is suitable for stabilizing wool/rayon mixtures goods. The machine introduces several features and the Metrovick infra-red heating elements seem destined to play an increasing part in textile finishing machinery.

New machine for trimming selvedges

Anon. *Textile Recorder 69*, 110 (May 1951).

The "Gara", a new machine marketed by Muschamp Taylor Ltd., is said to be suitable for the trimming of cloth woven on every type of automatic loom. It has also been designed to work in conjunction with a specially planned unrolling machine. In operation cloth passes between guide plates on the trimmer head, and two rapidly rotating brushes above and below the cloth insure that every trailing end of weft is taken beyond the cloth edge at an angle of 90° to be cut by rotating circular knives. Suction then removes the loose ends to a receptacle under the machine. A weft splitting attachment to cut open weft loops is also available.

New staple treating machine

Anon. *Skinner's Silk & Rayon Rec. 25*, 1118 (Aug. 1951).

The latest Blaschke aftertreatment machine for the wet processing of rayon staple (washing, bleaching and desulfurizing) has grooved rollers which replaces the usual perforated conveyor belts. Even treatment of the staple is claimed and the combing action of the grooved rollers prevents loss of staple resulting from fibers moving away from the fleece.

New uses for nitrile rubber

John S. Trevor. *Textile Recorder 69*, 88 (May 1951).

This review of the useful applications for nitrile rubber in the textile industry includes coatings and adhesives for fabrics, cements, sol-

vent solutions, cloth laminates, and plant accessories required to withstand abrasion and impact shocks and to be unaffected by natural oils.

Nylon fabric continuously set by radiant heat

Anon. *Textile World 101,* 148 (Aug. 1951).

A nylon-setting machine that permanently sets nylon-tricot fabric at a continuous rate of 16 yd. per min. has been developed by the McCreary Machine Works, Inc., Cohoes, N. Y. with the assistance of the General Electric Company's Industrial Heating Div.

Designed to be installed on existing tenter frames the new machine consists of aluminum reflector units that house Calrod tubular heaters.

Preparation and bleaching of cotton piece goods

A. Durfree Damon. *Textile Industries 115,* 98-103, 192-3 (July 1951).

In this first of a 3-part series of articles, practical information is given on the preparation of cotton piece goods for bleaching. The history and development of bleaching is reviewed, and the influence of the laboratory on the present-day process is discussed. Other subjects covered include the clerical work necessary before running the goods, sewing and starting the goods for the kier and the continuous bleach range, singeing, and desizing.

Scouring and milling

B. F. J. Moxon. *Textile Mfr. 77,* 253 (May 1951).

Results of a survey carried out by the Wool Industries Research Association on scouring and milling are discussed with a preferred method of scouring described.

Steam consumption in the continuous recirculatory drying of textiles

F. W. Thomas. *Textile Mfr. 77,* 240-1 (May 1951).

The sources of heat loss under various conditions in a stenter, or other continuous recirculatory drying machines, are analyzed; and an endeavor is made to derive a minimum value for steam consumption in relation to the weight of evaporated water in these machines.

DYEING AND PRINTING E

Apparatus for dyeing and after treating fibers

Sumner H. Williams (to General Dyestuff Corp.) USP 2,552,078, May 8, 1951.

In a fiber dyeing apparatus, a vat, an endless foraminous conveyor for fibers, means for feeding fibers onto the conveyor, a coacting conveyor for holding the fibers on the first conveyor for a portion of its travel, rolls for guiding the endless conveyors into and out of the vat, means for directly spraying dyeing solution on the fiber on the conveyor before the coacting conveyor is associated therewith, a trough for receiving excess dyeing solution supplied by the spraying means, and means for supplying a film of spraying solution from the trough to the fibers.

Continuous fixation processes for water-soluble dyestuffs

G. T. Douglas. *Textile Mfr. 77,* 251-2 (May 1951).

Uniform preparation of fabrics to insure even pick up in padding, use of dyes that have good solubility, and the avoidance of the use of electrolytes, which lower the solubility of water-soluble dyes, are some of the essential points to be considered in continuous dyeing of water soluble dyes. Other factors considered include padding conditions, steaming, and results obtained with special dyes.

Copper technique for dyeing acrylonitrile fibers

T. A. Field, Jr. & G. H. Fremon. *Textile Res. J. 21,* 531-9 (Aug. 1951).

The use of small amounts of dissolved copper in the dye bath to improve the dyeing of acrylonitrile fibers is described. Cuprous copper, obtained by reducing cupric acetate or sulfate in the dye bath, is the preferred form. The technique appears to be specific to acrylonitrile fibers, and is most effective with acid, direct, and soluble acetate dyes. Data on sorption of copper and of other metal ions by acrylonitrile fibers and various non-acrylonitrile fibers are presented, and possible complexes between copper ions and polymeric acrylonitrile are postulated.

Differential dyeing in yarns

Brit. P. 645,148. British Celanese Ltd. *Textile Mfr. 77,* 260 (May 1951).

Differentially colored yarns and fabrics are obtained by dyeing staple fiber yarns, or fabrics containing the yarns, which are of uniform count and have a twist varying along the length of yarn but not exceeding 25 turns per inch. Any convenient manner may be used to insert in the yarn a twist that varies along the length of the yarn. In an example given, dark streaks in the fabric occur where the low twist portions of two ends come together, and light streaks in the fabric occur where the high twist portions of two

ends come together. The resulting fabric has a flecked appearance.

Dying of synthetic fibers

M. T. Vickerstaff. *Bull. L'Inst. Textile de France 23,* 29-38 (Feb. 1951) ; *in French.*

The author discusses how the dyeing of synthetic fibers has yielded much information on the technical aspects of dyeing. The use of rayon has clarified the dyeing of cellulose by making it possible to differentiate between the chemical affinity of the fiber for the dye and the effects of variations in the physical structure of the fiber. The use of various deniers has demonstrated the various optical effects produced by thick and thin filaments. The use of polyamide fibers has confirmed the importance of basic groups in dyeing with acid dyes and the way dyeing is affected by the number of reactive sites in the fiber.

The dyeing and printing of wool

R. L. Elliott. *Textile Recorder 69,* 119 (May 1951).

Modern requirements for the selection of a suitable dye for wool, the application of acid dyes on wool, developments in wool dyeing, and the printing of wool fabrics are outlined.

Method for producing indigo vat dye paste

Daniel Zinner (to E. I. duPont de Nemours) USP 2,559,269, July 3, 1951.

The method of producing a high density, essentially air-free indigo paste, which will not cause objectionable froth or foam when dye baths are prepared, from a water slurry of indigo containing occluded air which comprises filtering the slurry to produce a filter cake of indigo, passing steam through the filter cake until substantially all of the occluded air is removed as indicated by the cessation of flow of water from the cake into the filtrate, and then adding water to the filter cake to produce an indigo paste of desired concentration.

Package dyeing of synthetic fibers

G. T. Douglas. *Can. Textile J. 68,* 53-55, 57, 59, 61 (Aug. 3, 1951).

Principles of package dyeing, preparation of packages, liquor flow conditions, applications of dyestuffs are discussed and suggestions on control of dyeing operations given.

Practical aspects of pigment dispersion

W. H. Hoback. *Calco Technical Bull. 903,* 1-21 (1951).

Concepts and principles with respect to the

dispersion of pigments have been studied, presented on the basis of a consideration of vehicle types in terms of their viscosity, structure and tack, and related to the fundamental problem of converting pigment from its form as a dispersion of solid particles in air to a dispersion of solid particles in the liquid binders employed for protective coatings. In dispersion processes based on a shearing type of operation, a high order of strength in the vehicle is required along with a technique based on mixing and shearing of the pigment masses at the highest pigment concentration consistent with the strength of the equipment employed.

In contrast to the strength requirements shown as necessary for the shearing type of dispersion operation, the dispersion of pigments in the pebble mill has been presented as a system based on optimum mobility with vehicle strength reduced either by choice of vehicle type or by dilution with solvent. The consistency of the mill charge is a major controlling factor with economic consideration recommending that the optimum grinding consistency be developed with a high concentration of pigment, a low concentration of vehicle solids and the requisite amount of solvent.

Titanium Dioxide has been used as a subject for presenting the examples of poor and excellent dispersion procedures. The dispersion characteristics of the family of Titanium Dioxide pigments comprising untreated and chemically modified types of both the Anatase and the Rutile classes have been presented and it has been shown that, in addition to the meritorious use characteristics, greater facility of dispersion is also obtained by chemical modification.

SPECIAL FINISHING F

Dull finish for nylon hosiery

Staff. *Textile Industries 115,* 75 (July 1951).

"Vibralon", a nylon hosiery finish which can be applied either by the conventional or the Dunn methods, is reported to give nylons a lasting, rich dullness, satin-soft feel, extra warmth, better moisture-absorbing qualities, etc. Snag and pick resistance is also increased with the life of the hose prolonged. The finish is reported to be particularly effective on 15 denier monofilament hose. Mfr. W. F. Fancourt Co.

Hardening treatment for casein fibers

Brit. P. 644,958, Courtaulds Ltd. *Textile Mfr. 77,* 259 (May 1951).

Continuous tow of casein or like protein fibers are treated with a hardening liquid of specific gravity greater than that of the fibers by continuously feeding the tow in convolutions on to the surface of the liquid bath so that the convolutions float in the liquid. The convolutions are continuously sprayed with hardening liquid. When the desired effect is produced, the tow is continuously withdrawn at a rate equal to the rate of feed by removing the tow from the underside of the convolutions and conducting the tow through guiding means so as to avoid entanglement.

Lightweight fire resistant treatments for clothing and tentage

Allan J. McQuade. *American Assoc. of Tex. Tech. 6,* 75-9 (June 1951).

Of the commercially available fire-resistant treatments tested to date, the resinous nitrogen phosphate treatment appears to be the closest to imparting fire-resistant qualities without detracting from other desirable characteristics of clothing fabrics. Fire resistance is needed for clothing made from cellulosic materials. New lighter weight fire-resistant finishes for tentage provide two distinct advantages over the antimony oxide-chlorinated hydrocarbon system that has been used previously.

First, flexibility is not impaired by subjecting the fabrics to temperatures as low as—60° F. In addition, the add-on weight is only 20 percent as compared to more than 60 percent and results in a savings of approximately 13 pounds in the total weight of the tent over what it would have been had the fabrics been treated with antimony oxide-chlorinated hydrocarbon system.

Whitening textile materials

Brit. P. 645,413, I.C.I. Ltd. *Textile Mfr. 77,* 261 (May 1951).

The process for manufacturing new substances useful for whitening textile materials comprises reacting two molecular proportions of cyanuric chloride with one molecular proportion of 4:4′-diaminostilbene-2:2′ disulfonic acid of a salt thereof, two molecular proportions of dimethylamine or morpholine, and two molecular proportions of a primary or secondary aliphatic amine free from hydroxyl groups, or of a primary aromatic amine either free from substituents or which carries as nuclear substituents one or more alkyl radicals or one radical selected from -Ome, and $-SO_2NH_2$.

TESTING AND MEASUREMENT G

Clothing and fabrics G 1

Engineering of wear resistant fabrics

R. G. Stoll. *American Assoc. of Tex. Tech. 6,* 71-4 (June 1951).

Improvement of wear resistance of fabrics is one of the most economical ways of conserving raw materials, production capacity and manpower. Wear resistance was increased three fold over herringbone twill by the mixture of 25 to 50 percent nylon staple in filling yarns of a sateen construction. Data is presented on the mechanism of wear and on the effect of yarn and fabric construction.

Measuring fiber length

Thomas Fyfe. *Tappi 34,* 306-10 (July 1951).

An optical projection method for measuring fiber length is described in sufficient detail to permit easy adoption. Statistical data are included to show the reproductibility of the method and various types of graphs illustrate the number of warp that results may be reported.

Measurement of yarn irregularity

Eugene Sorez. *Textielwezen 7,* 23-25 (1951); *in French.*

Three yarn irregularity testers are described: (1) The Regularimetre consists of a mercury feeler which comes into intimate contact with the thread. The most minute deformation of the liquid is electrically recorded. (2) The Automatic Statistical Dynamometer measures the breaking stress and elongation, the fore-elongation diagram, and the work done in breaking the thread. (3) The Harmonic Analyzer deals with the photographic data supplied by (2).

Instruments and instrumentation G 2

Air permeability of woven fabrics

Karl A. Williams, Jr. PB 103,433. *Bibl. of Tech. Reports 16,* 53 (Aug. 7, 1951).

An apparatus for the measurement of air flow through woven materials has been constructed by modifying a commercial instrument. This apparatus is, essentially, a plug and orifice type flow meter. The mechanism of permeability or air flow was found analogous to that of flow through an orifice. Porosity and the size of the opening have an effect on the weight flow of air through the cloth. A cloth most permeable to air weight flow would be one woven on the square

with the lowest possible denier yarn.

Ballistic determination of work of rupture of short textile samples

W. R. Lang. *J. Textile Inst. 42,* T314-28 (July/Aug. 1951).

Modifications of the ballistic pendulum to permit the measurement of the work of rupture of short textile samples of a minimum length of 0.1 inch are discussed and an instrument of satisfactory performance is described. Details are given of its applications and limitations.

Determination of moisture on textiles

A. Garin. *Bull. L'Inst. Textile de France 23,* 9-25 (Feb. 1951) ; *in French.*

The stoving method, vacuum stoving method, azeotropic distillation method and the Fischer method improved by the use of electronic toning detector are compared with the method of evaporation in a ventilated or unventilated drying oven. The detrimental influence of atmospheric moisture and hygroscopicity of textiles on the precision of the analyses are stressed.

Evaluating warmth of textile fabrics

John D. Tallant and Ruby K. Worner. *Textile Res. J. 21,* 591-6 (Aug. 1951).

A semi-automatic apparatus has been assembled for measuring the thermal transmission of fabrics while subject to moving air at constant temperature. The apparatus employs the principle of measuring the difference in the amount of energy required to maintain constant temperature in a body when bare and when covered with the test specimen. Conditions have been set up with an air velocity of 12 to 13 m.p.h. so that the performance under fairly severe conditions of use can be approximated. Results are expressed as "thermal efficiency". Formulas are given for converting to other units as desired.

New instruments for quality control

Anon. *Textile Recorder 69,* 109 (June 1951). See front section.

Pacific evenness tester

Anon. *Am. Wool Cotton Reptr. 65,* 7-8 (Mar. 29, 1951).

The Pacific Evenness Tester is designed to test evenness and determine the weight of sliver, roving, and yarn from 4.5 ounces per 5 yards wool sliver to 100s worsted yarn, or the equivalent in any other fiber. The tester includes a pair of rolls consisting of a top tongued roll and a bottom grooved roll. The bottom grooved roll is positively driven through a flexible coupling by a rear

reduction motor; and the top tongued roll is friction driven and is mounted in an arm which is pivoted in a casting mounted on the base. When the sliver, roving, or yarn is introduced between the rolls, any variation in the thickness causes a linear movement of the top roll either up or down, and recording instruments which are part of the machine produce a printed graph showing these variations. Two sets of tongue and grooved rolls are available and are used interchangeably so as to encompass a wide range of weights. Each set of rolls contain 3 grooves of different widths with 3 corresponding tongues. The rolls are of hardened steel, ground with extreme precision since the accuracy of the test depends on the accuracy of these rolls.

Tensile recovery behavior of textile fibers

Geo. Susich & Stanley Backer. *Textile Res. J. 21,* 482-509 (July 1951).

Using the Inston tensile tester, a cycling method was developed to measure directly the total elongation and permanent set and to permit also determination of the immeidate and delayed recovery. The conditions of the tests were made on the effect of deviations from the standardized conditions. The recovery behavior of 25 samples representing 16 different textile fibers was measured under the standardized conditions. Their recovery behavior is presented by tabular data and by two series of rectangular graphs. The recovery behavior was found to be characteristic for any material; however, it was affected by the history of the samples. The recovery of Fiberglas, cotton, Saran, viscose, acetate, nylon, Orlon acrylic fiber, Fiber V, Vinyon CF-HST, N, NOZZ, NORU, wool, casein, and polyethylene is discussed, and an attempt is made to interpret the data.

Yarn measuring machine

Joseph K. Cobert. USP 2,559,113, July 3, 1951.

Yarn measuring apparatus comprising opposed stationary and movable yarn compressing elements between which the yarn is pressed during each measuring operation, force applying means arranged to shift the movable yarn compressing element to a yarn compressing position in the direction of the stationary yarn compressing element by the application of a force of predetermined constant magnitude so that the distance travelled by the movable yarn compressing element during each yarn compressing movement thereof varies according to the denier of that

portion of the yarn which is interposed between the yarn compressing elements, means for shifting the movable yarn compressing element to a yarn releasing position away from the stationary yarn compressing element and against the resistance of the force applying means after the movable yarn compressing element has reached the end of its travel in a yarn compressing direction, a stop member carried by and movable with the movable yarn compressing element, a scale plate, a pointer arranged to travel over the scale plate and means for operating and controlling the pointer so that it is held in a starting position during the yarn compressing operation, is moved over the scale plate at the end of the yarn compressing operation to an indicating position which is predetermined by the position to which the stop member has been moved at the end of the yarn compressing operation and is returned to starting position simultaneously with the movement of the movable yarn compressing element to its yarn releasing position, the last mentioned means including biasing means acting against the pointer to move it from its starting position to an indicating position, means for holding the pointer in its indicating position against the resistance of the biasing means during the yarn compressing operation and means for rendering the holding means ineffective upon completion of the yarn compressing operation to release the pointer for movement to an indicating position under the influence of the biasing means and a member attached to and movable with the pointer and engageable with the stop member to bring the pointer to rest when it has travelled a distance predetermined by the position of the stop member at the end of the yarn compressing operation.

TEXTILE MILLS H

Bates Manufacturing Company

Anon. *Saco-Lowell Bull. 23,* 23-31 (June 1951).

See front section.

The British Industries Fair, 1951

Anon. *Textile Mfr. 77,* 230-2, 234-6 (May 1951).

Brief details are given of some of the exhibits, of interest to the textile industry, shown at the British Industries Fair, April 30 to May 11.

Clamp for fork trucks is self-centering

Anon. *Textile World 101,* 152 (Aug. 1951).

See front section.

Diesel waste heat used by Swiss mill

Anon. *Textile World 101,* 149 (June 1951).

Diesel engine-generator set runs and heats a cotton mill and part of a mill village. About 76% of the total heat in the fuel goes into electricity and space heating. Engineers call the system "about as good as you can do."

Discuss maintenance problems

Staff. *Textile Industries 115,* 113, 115, 117 (July 1951).

A report on some of the discussions held at a meeting of the Alabama Textile Operating Executives is presented. Included are the following subjects: metallizing; compressed air for cleaning; machine shop personnel; maintenance of fluorescent light fixtures; maintenance of motors, starters and transformers.

Fault location in electrical installations

Anon. *Textile Mfr. 77,* 227-9 (May 1951).

Open circuits, earth faults, and short circuits are three types of faults that may occur in circuit conductors; and an earth fault or a short circuit may result in an open circuit. In this discussion of faults in electrical installations the following subjects are examined: open circuits in neutral lines, breaks in phase conductors, single-phasing of delta connected motors, locating the cause of single-phasing, testing for open circuits, and electrostatic test for open circuited cable.

Half-hose handling cost reduced

Staff. *Textile Industries 115,* 85 (July 1951).

By the use of a 42 foot long conveyor belt at Alden Mills, 300 dozen pairs per hour of circular-knit half-hose are stamped, labeled, folded and packaged. Thirteen operatives are employed at the conveyor belt, and a savings of one cent per dozen pairs of half-hose is reported. A pressure sensitive tape is used in packaging due to the additional time required to apply the type of tape formerly used.

Improvement of detail in Swiss textile machinery

Anon. *Textile Recorder 77,* 97-104 (May 1951).

At the 1951 Swiss Industries Fair held at Basle from April 7 to 17, improvements in Swiss textile machinery to facilitate operations and to increase productivity were in evidence. Highlights are described of some of the developments in spinning machinery, doubling machinery, pirn winding machinery, warping machinery, weav-

ing and auxiliary machinery, knitting machinery, and dyeing and finishing machinery.

Industrial cleaner operates on compressed air

Anon. *Textile World 101,* 148 (Aug. 1951).

See front section.

Lubrication problems in the textile industry

K. M. Lowry. *Textile Age 15,* 16-18, 21-22 (Aug. 1951).

See front section.

Mechanization helps stem rising production costs

F. H. Slade. *Textile Mfr. 77,* 292-5 (June 1951).

Cost reduction, through increased productivity, can only be achieved by high technical efficiency. Modern methods for handling materials offer valuable contributions by facilitating movement of materials, releasing manufacturing area and increasing storage capacity.

Mooresville Mills

Anon. *Saco-Lowell Bull. 23,* 19-22 (June 1951).

See front section.

Packaged steam power plant is now available

Anon. *Textile World 101,* 150 (Aug. 1951).

See front section.

Profits from effective textile machinery lubrication

F. S. Jones. *Textile Industries 115,* 92-5 (July 1951).

In this first of a series of articles on textile machinery lubrication, information on lubricating practices is given for opening and picking machinery. The lubrication of old equipment is discussed with the use of bottle oilers on old equipment and the lubricants recommended described. Other subjects discussed include the lubrication of vertical openers, line shaft bearings, and anti-friction bearings. Lubricants are recommended for modern mills, and the profits from correct lubrication of opening and picking room machinery are classified. The importance of a well planned lubrication program together with a competent head is stressed.

Special features in new worsted factory

Anon. *Textile Mfr. 77,* 245-6 (May 1951).

Some details of the new worsted mill of Patons & Baldwins Ltd., at Darlington, are described. Features include mechanical handling devices,

complete air conditioning except in the wool warehouse, mechanized methods of sorting and blending, new centrifugal spinning machines, etc.

Spindale Mills — where quality has top billing

W. A. Thomason, Jr. *Textile World 101,* 98-101 (Aug. 1951).

See front section.

Textile problems and technical developments

Anon. *Textile Recorder 69,* 111-12 (May 1951).

Brief reviews of the 4 papers read before the conference of the National Federation of Textile Works Managers' Associations are presented. The papers include: "Short Processing" by A. E. Whitehead; "Modern Developments in the Use of Rayon and Other Man-Made Fibers and Filaments" by H. A. Thomas; "Yarn Dyeing Developments" by W. Sturzaker; and "Developing the Will to Work" by W. T. Shackleton.

The importance of conservation to the textile industry and the American public

S. J. Kennedy. *Amer. Assoc. of Tex. Tech. 6,* 65-70 (June 1951).

See front section.

Tubular knit goods conveyor profitable investment

Staff. *Textile Industries 115,* 104-6 (July 1951).

The consolidation of three separate and distinct knitting units into a single mill at the Utica Knitting Co. created the problem of how to handle the enormous, concentrated output of the knitting department to keep goods moving smoothly. The installation of an overhead endless chain type conveyor with 120 pallets, designed to carry 30 to 50-pound rolls of different diameter tubular goods, has eliminated handling bottlenecks, eliminated need for storage space in the knitting area, kept aisles free, and increased efficiency.

Work study problems

Anon. *Textile Recorder 69,* 106-10 (May 1951).

Three of the papers given at the Work Study Conference of the Cotton Board in England are reviewed. These include: "Efficiency and Time Study and Their Correlation" by A. Ormerod; "Work Study and Cost Control" by I. T. Morrow; and "Measurement of End Breakage Rate" by P. D. Vincent and M. E. Brown.

CHEMISTRY AND PHYSICS OF TEXTILE MATERIALS I

A simplified method for the determination of the oil content of textiles

John H. Skinkle. *Am. Dyestuff Reptr. 40,* P30-32 (Jan. 8, 1951).

The standard method of determining the total content of oils and fats in textiles with an elaborate Soxhlet apparatus is time consuming. Various short-cut methods, which are generally considered less accurate than the Soxhlet method, have been proposed from time to time. This paper describes a quick, simple procedure which is carried out with the apparatus normally present in any laboratory. The new method is as accurate as the Soxhlet method according to comparative tests made with samples of known oil content. The time required for a single determination is about thirty minutes as compared with about three hours for the old Soxhlet procedure.

The new method is not new in itself, being merely a simplified modification of known methods. The demonstration that its accuracy is at least as good as the Soxhlet method, however, is new and has been proved statistically on an adequate number of samples by several cooperating mill laboratories.

Action of alkalis on regenerated cellulose

Albert Schaeffer. *Textil-Rund 6,* 159-69 (Apr. 1951); 219-225 (May 1951); *in German.*

The action of alkalis on regenerated cellulose was followed by determining the quantity of decomposed insolubilized cellulose, degree of polymerization, wet strength, elongation at break, absorption of alkali, ash content, and by making microscopic investigations. Graphical and photomicrographical results indicate that caustic soda solutions cause maximum damage. The relationship between bath volume and weight of material appears to have little or no significance and no direct relationship between damage and pH appears to exist.

Physicochemical properties of degraded celluloses

C. Pinte. *Teintex 61,* 171-85 (1951).

Properties are given of celluloses in which (1) the chain-length has been reduced, and (2) those whose functional groups have been changed.

Size and form of crystalline regions in solid high-polymer material

O. Kratky. *Kolloid Z. 120,* 24-39 (1951); *in German.*

A study of deformation structures led to the assumption of crystalline regions in band form: (a) in the case of cellulose from the difference in rapidity of orientation by calendering. Highly oriented cellulose hydrate showed an anistropy of the small-angle scattering on irradiation along the fiber axis. Line-breadth measurements of x-ray diagrams permit calculation of a lower limit for the size of crystalline regions. Agreement between line breadth and small-angle-scattering measurements for size of crystalline regions is good. Electron-microscope studies were also compared, particularly with respect to native cellulose.

Solution of cellulosic fibers

R. Hauch. *Melliand Textilber. 32,* 283-89 (Apr. 1951); *in German.*

On attempting to dissolve cellulosic material, it is found that solution is never complete, small particles remaining in a finely dispersed state. The proportion of undissolved material (which cannot be removed by normal high pressure filtering methods), depends upon the source of the cellulose. These particles are a source of trouble in that they tend to block the spinnerets; they are thought to consist of modified cellulose originating in the epidermis. Photographs of various solution stages of cellulose fibers (cotton) are given, together with some photomicrographs showing the distribution and shape of the particles.

Viscosity method for cellulose

A. F. Martin. *Tappi 34,* 363-6 (August 1951).

This paper suggests a technique for measuring viscosities of celluloses under conditions such that a constant viscosity is obtained and the velocity gradient is held at a selected value. An automatic compensation for chain length of cellulose is made by changing the concentration of the solution. The method appears suitable for both routine and research use. No attempt has been made to choose a solvent which might be best for use with this method. It is, however, extremely important to choose a solvent power at the [n]C value chosen.

Wool research progress report

A. D. B. Cassie. *Textile Mfr. 77,* 210 (May 1959); Comprehensive program of wool investigations. Anon. *Textile Recorder 69,* 115-16 (May 1951).

Research conducted by the Wool Industries Research Association for 1950-51 includes: the effect of different cylinder speeds on the quality of slubbing coming from the card, removal of burr and other vegetable matter by the woolen card, development of the auto-leveling device, the study of mixing in very short drawing processes, the study of tension in yarn in weaving and preparatory processes, etc.

TEXTILE EDUCATION AND RESEARCH J

Planning and conduct of experiments in woolen processing

A. Brearley. *Textile Recorder 68,* 97-100 (April, 1951).

Investigations and research under mill conditions cannot be carried out in the more advanced form of experimental design which would be used when carrying out an investigation on the laboratory scale. However, the Wool industries Research Association of Britain has conducted experiments in mills for the past few years, and some of the experience gained from their methods are outlined. The methods are said to be applicable in almost any woolen mill with a minimum of effort.

The methods described are those that would be employed for a hypothetical technical change such as an investigation of a possible change in oil being used for a shoddy blend. Around such a hypothetical experiment, the author outlines a suggested procedure to effect the closest possible control over the experiment under mill conditions. Suggestions on samplings at each process of woolen manufacture are given. Varieties of tests on slubbing, spinning, and fabric are revealed. Three references are given for the purposes of acquainting the mill man with sources of information on elementary statistical methods.*

*(These references are: Tippett, L. H. C. "Statistics". Oxford University Press; Chambers, E. G. "Statistical Calculations for Beginners". Cambridge University Press; Brearly, A., and Cox, D. R. "An Outline of Statistical Methods for Use in the Textile Industry." Editor).

Textile finishing developments

Anon. *Textile Weekly 47,* 48 (January 1951).

According to B. P. 626,517 vat dye shades on nylon are obtained by dyeing this fibre in a bath

at about 95 degrees Centigrade in which this vat dye is present in its fully oxidized form together with swelling agents for the nylon such as butyl alcohol, formic acid, phenol and sulphuric acid; the resulting shades have much greater fastness to light than those obtained by application of the vat dye in its reduced state. Here it is believed that increased light fastness is due to the vat dye being deposited within the nylon fibres in a particular aggregated state which is more resistant to attack by light.

In America research is going on in order to discover what benefits can be obtained by dyeing at temperatures much exceeding 200° C. Most of this work is being done on wool, since usually this fibre, by contrast with other fibres, does not pick up much dye below temperatures approaching the boil. It is found that the rate of dyeing can be tremendously accelerated—this applies for most fabrics including nylon. Thus by dyeing nylon for 75 seconds at 275° F. the same depth of shade can be produced as results from dyeing for one hour at 212° F. In the case of wool only one minute's dyeing at 275° F. is required to give the same depth of shade as can normally be secured by dyeing for two hours at 200° F.

Whitin Machine Works opens modern research and development division

Anon. *Textile Age 15,* 34-7 (May 1951).

Whitin Machine Works has consolidated its experimental, research and development departments into one, large, completely equipped building so as to increase efficiency and enlarge the scope of operations. Scientific study of fiber processing on preparatory equipment will be made in terms of immediate technological and machine development problems as well as long range research in fundamental textile research and machine development. An outline of the complete range of machinery located in the new Research and Development Division is presented. In addition to these latest model textile machines, the laboratories for testing fibers and yarns have installed the latest types of equipment.

The TEXTILE TECHNOLOGY DIGEST serves double-harness for most mill readers. When you have finished reading your copy, pass it along to the next man.

Refer interested outside readers to the Editor, TTD, Institute of Textile Technology, Charlottesville, Virginia.

Our goal: one hard-working DIGEST in every mill in the United States and Canada.

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Canadian patents may be obtained from the Commissioner of Patents, Ottawa, Canada. Printed copies of Canadian patents issued since January 1, 1949, are now available and may be purchased at 25¢ for a copy of less than 50 sheets of printed matter. For patents of over 50 sheets the price is $1.00 a copy.

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Abstracts of U. S. patents are prepared from copies of the patents. Abstracts of Australian patents are taken from *The Australian Official Journal of Patents, Trade Marks, and Designs.* Abstracts of Canadian patents are prepared from claims published in *The Canadian Patent Office Record.*

SPECIAL REPORT

Smyre Mfg. Co. Becomes ITT Member

A. M. Smyre Manufacturing Company of Ranlo, North Carolina, has become a member of the Institute of Textile Technology at Charlottesville, Virginia, according to an announcement by Mr. Fred L. Smyre, Jr., President of the prominent North Carolina mill.

The Smyre Company, manufacturers of quality combed cotton and spun rayon yarns, thus joins other large Southern mills in sponsoring the research and educational services of the Institute.

NEW FELLOWSHIP

American Cyanamid Company announced that it has established a two-year graduate fellowship at the Institute. The grant, amounting to $5,000, is for a course of studies in textile chemistry leading to an M. S. Degree in Textile Technology.

Richard Paul Barber, 20 Presbery Avenue, Taunton, Massachusetts, a graduate of Bradford Durfee Technical Institute, has been selected by the Institute to study under the fellowship. He will pursue the degree until June, 1953. During the 1952 summer vacation, he will work at one of the member textile mills associated with the Institute.

American Cyanamid, the nation's fourth largest chemical company, is currently financing a number of fellowships at various universities and colleges. As a leading manufacturer of chemicals and dyes used by the textile industry, American Cyanamid makes about 5,000 different products for more than 200 different industries.

NOTE FROM MEMBER TO A NON-MEMBER MILL

"I am quite confident that the services the Institute can render to an organization like yours are invaluable and may be, perhaps, an insurance to the progress and success of your fine organization for the future. I believe I wrote you regarding the huge laboratory set up by a number of very large companies, and that perhaps the Textile Business is following the trend of consolidation within a few companies, similar to what has happened in Motor, Steel and other Industries."

Quarterly Report on ITT

The quarterly meeting of the Technical Advisory Committee and the Board of Trustees heard reports from all quarters of the Institute. Great progress was reported in nearly every instance. The present status of Institute services was summarized by the President, Dr. J. L. Vaughan, in his report to the Board. Excerpts of this report follow:

"The words "enthusiasm" and "esprit de corps" describe the most marked achievement of the last quarter. A contagious enthusiasm has been displayed by the Trustees, the Technical Advisory Committee, and the staff. It is as though the Institute had suddenly come alive. The efforts of the Trustees and Technical Advisory Committee and the vigorous, concerted effort of the staff have given the situation a feeling of "rightness" that holds high promise for the future.

Recently when Mr. G. W. Lobb, Assistant to the Director of Shirley Institute, was here, he reminded us of the striking parallel between the early history of Shirley Institute and I.T.T. Men in the textile industry in England saw the need for research, so Shirley was established. There followed years of struggle when the staff at Shirley faced the vicious circle of need for funds to hire staff and buy equipment in order to do superior research and testing to give members their money's worth, so that they would give hearty support and influence others in the industry to join so that broader usefulness could be achieved and bring further income to do more work and hire more staff to produce even better research and instruments.

As I see our Institute, it was founded in clear recognition of the need for research and testing for the textile industry. High hopes accompanied its beginning. Last year the Board of Trustees reasserted their faith in the idea and recognized the paramount need for new thinking and techniques and went bravely forward. Now we are in a second phase where there is tangible evidence that the Institute is on the threshold of achieving some of its original promise — the Uniformity Analyzer is being produced in reasonable quantity and pushed by Brush Development Company; the Lap Meter has been built and is under test in two mills, the tarry spot project shows new developments; the humidity tests are underway at a member mill; and the mildew test work is ready for mill trial."

ITT Discovers New Source of Tar Spots

Tiny resin sacs of vegetable origin are a newly discovered source of "tar spots" in cloth which annually cost textile plants hundreds of thousands of dollars to remove, it was revealed today by the Institute of Textile Technology.

For years scientists in mill laboratories, colleges and research centers have been pushing a wide-scale detective job to solve the question of where "tar spots" come from, believing all resulted from flecks of tar or asphalt picked up by cotton during its journey from fields to mills.

Though the spots cause only small blemishes in fabric, they have become more noticeable with recent improvements in cloth quality, so that many textile companies have been forced to classify thousands of yards of goods as "seconds" or are spending large amounts for special cleaning treatments.

Dr. Jack Compton, Technical Director of the Institute of Textile Technology, reports that while a large number of the spots which plague manufacturers and customers alike are caused by asphaltic materials, a discovery by Leo Hubbard, ITT research chemist, proves beyond doubt that many come from resin sacs normally present in leaves or burrs which become mixed with cotton fiber during harvesting.

These tiny egg-like capsules, about one-fiftieth of an inch in size, can often be spun right into a piece of yarn and woven into the cloth. When heated, they burst and a black substance resembling tar flows out to cause a smudge. Ordinary bleaching operations cannot remove the stain, distinguishable because, unlike tar spots, this resinous substance will not dissolve in petroleum solvents.

Hubbard's discovery marks the first time in the history of cotton culture and manufacturing that science has traced "tar spot" trouble to vegetable resin sacs, Dr. Compton states, and opens a new way toward eliminating the problem.

Radio Schedule of Compton Talks Changed

After the September DIGEST went to press, the Institute was informed that the two talks by Dr. Jack Compton had been re-scheduled for November 21 and November 28.

Dr. Compton's second talk, entitled "CMC—Cotton Anti-Soiling Aid," follows:

"No field of cotton utilization research is more important than the study of chemical treatments and their effects on fibers and fabric. As a result of this type of research, ways have been found to give cotton many new and sometimes exciting properties. Today I want to tell you about a treatment which undoubtedly will make cotton a more desirable and popular fiber since it helps cotton goods to resist soiling and makes them easier to wash clean.

This new treatment was discovered recently at the Institute of Textile Technology in Charlottesville, Virginia, during the course of work under contract with the U. S. Department of Agriculture as authorized by the Research and Marketing Act of 1946, and supervised by the Southern Regional Research Laboratory, New Orleans, Louisiana.

The treatment consists of adding a small amount of a chemical compound, "CMC," which is technically the sodium salt of carboxymethyl cellulose, to the final rinse water each time cotton goods are washed. When CMC is thus applied and allowed to dry, it appears to coat the cotton fibers with a smooth film which prevents the tenacious adherence of soil to cotton fabric and causes the fabric to wash clean easier during subsequent washing. This is due to the suspending power of the relatively high concentration of CMC at the fiber surface on the dirt detached upon contact of the treated and soiled fiber with water.

The small amount of CMC which is incorporated in a number of synthetic detergents on the market does not permit the realization of the full benefits of the compound.

CMC may be successfully used in home and commercial laundries or by textile manufacturers in either of two ways: (1) as a soil resistant finish applied to the last rinse cycle during washing; and (2) as sizing in place of starch. About three level tablespoonsful of the dry powdered CMC in a gallon of water, or 0.25% solution, improves the soil resistance of the cotton fabric without changing its feel, whereas by increasing the amount of CMC to 12 tablespoonsful, or about a 1.0% solution, the fabric will have a stiff, starch-like finish.

As the product becomes more widely available, CMC will help to make cotton a more popular fiber for children's clothes, work and play clothes for grown-ups, household articles, and a host of other uses."

10

Device Cleans Steel Rollers Automatically---New Fifteen-Inch Coiler Head Prevents Much Uneven Sliver---"Tar Spots" Are Still With Us

Textile Reporter's Digest

MEANS FOR CLEANING THE ROLLERS OF SPINNING FRAMES

The patent describes a travelling cleaning device that cleans steel rollers on drawing, roving, and spinning frames. The device is attached to the rollers during scrubbing or overhauling operations and cleans them automatically.

The frame of the device slides along one row of rollers, but cleans the adjacent row of rollers. The clearing or cleaning element is in contact with the adjacent steel roller.

The means or driving the travelling cleaner is simple. A series of cones are mounted on the cleaner assembly and are driven by contact with the first steel roller.

While not explained in detail by the patent, it appears that the device has to be switched from one line of rollers to another in order to clean the whole set of rollers. And, of course, the rollers have to be in motion in order to furnish power to the travelling cleaning device. (USP 2,562,451, by Florimond Delepierre & Jules C. Ghesquiers, July 31, 1951.)

NEW SELVAGE MOTION

A subsidiary warp let-off motion specially designed for the weaving of good quality selvages in high grade fabrics has been developed by Sidgwick Mills Ltd., Bradford, and is being marketed by T. Lund and Son Ltd., Bingley, Yorkshire. It is a self-contained unit, easily installed, and incorporates means for fine tension adjustments.

A selvage warp bobbin is held by a main bracket and the selvage yarns pass, via a smaller flanged bobbin into the main warp. The bracket is mounted in the loom on a square section rail which allows both lateral and vertical adjustments of its position. The warp bobbin is fitted with a brake pulley which accommodates a 3/4 in. brake strap, one end of which is attached to a fixed point on the main bracket; its other end can be fixed at several alternative positions on a spring loaded lever. The position of the spring can also be varied at one end and there is further provision for adjusting its tension by means of a nut.

This simple and efficient device is claimed to maintain uniform selvage tension and only to require initial adjustment according to predetermined requirements. No maintenance duties are involved apart from the necessity of keeping the braking surfaces clean. (*British Rayon and Silk Journal*, September 1951, p. 62.)

AATT ROUND TABLE ON RESEARCH IN COTTON

Approximately all of the western cotton belt is now planted on a fairly well standardized basis with respect to varieties. It is possible, in the mid-South, to get cotton from areas that are fairly well standardized, if you know what variety you want in what area. But in the Southeast, there isn't the degree of standardization that could be desired, although there is some. But I would say that in comparison with the several hundred varieties and strains that were being grown in this country 25 or 30 years ago, now about 90% of our total crop is of some six or seven varieties. It seems to me that indicates real progress. But outside of the irrigated areas, it takes right careful study in each case to find just exactly what you want.

Mechanical devices are being employed in preparing the fiber test specimen for machine measurement. There are probably a number of concerns that have done work in that field. USDA began trying to do the blending of the fiber that earlier was done purely by hand methods some four or five years ago. Mr. Baker of the U. S. Testing Company has done work in that field. Mr. Pfeiffenberger of Chicopee has done considerable work also. USDA is now equipping all laboratories with a blender that we have worked out in our own laboratories. It is a little different in principle from any of the others that we have seen. It entails the use of drafting rolls as well as a cylinder covered with card clothing. We can prepare a specimen now in about five minutes. By the hand method it takes about 20 minutes or longer.

To show the extent that the mills are using these new fiber tests in their cotton buying program, we know that on a random sample basis, five bales out of a 100 bale lot, probably as much

as 20 or 25 per cent of the crop is now being merchandised on that basis. Of course, it would be impractical to make fiber tests on the eight or ten million bales that are used in this country. That is, it would be impractical with the present facilities and probably with the present methods. It would be economically impractical.

We have been giving some thought on the use of the Micronaire and I think other people have too, but to date there isn't too much encouragement on its use for the purpose of evaluating maturity. I still think there may be some possibility there, but the technique for doing the job accurately hasn't yet been worked out so far as I know. We do know, however, that some mills are successfully using the Micronaire as a means of screening cotton of known variety so as to eliminate bales that are outside the normal range of fineness attributable to the maturity factor. (*AATT Magazine*, June 1951, pp. 122-123, condensing discussion by Dr. John W. Wright of USDA.)

15-INCH COILER HEAD FOR CARD AND COMBER

A new coiler head, which has been given extensive mill tests, is designed for use with a 15" can. Not only is the can capacity doubled when this head is used, but the coiler head is so designed that it lays the sliver in the can in a series of overlapping 6" circles around the circumference, permitting a 3" hole down the center of the coil. The opening in the center prevents formation of the hard core common to the conventional coil, the manufacturer claims, eliminating a cause of much uneven sliver.

An offset design permits the coiler to be used with 15" cans without interference with the comb box on a card. It is equally adaptable to use with a comber. While the coiler head could be used on drawing frames, the front of the frames would have to be converted to allow staggering of the 15" cans to get the same number of deliveries.

By a change of turntables, any size can from 14"-16" may be used. Mfr.: Petty Machine Co., Inc., Gastonia, N. C. (*Textile Industries*, October 1951, p. 188.)

"TAR SPOTS" ARE WITH US

Bleacheries and mills are still having their troubles with tar on cotton goods. Opinions among mill men are that in addition to bale ties coated with tar, the foreign material may be thrown onto the bales during transit along highways by truck. A test for locating tar prior to processing in the grey goods mill is now available. One commercial bleachery man advises that he is now "100% on tar goods," every mill which sends fabric to be bleached or finished has tar in the cloth.

More than a dozen years ago mills were troubled with "black specks" showing up in the cloth, and authoritative sources identified the foreign material as "tarry organic matter." Some mill men were of the opinion that the specks were not in the grey cloth, but entered the fabric after the finishing process between the water mangle and the starch mangle.

Although part of the trouble may have been caused as stated, finishing plants and commercial laboratories were quick to point out that the substance arrived at their doorsteps in the goods and they were not to blame. Furthermore, it was proved beyond dispute that the black specks were in the stock at the time of drafting on cotton type machinery. In many instances the foreign matter appeared in the warp or filling only — not both places.

How "Tar Spots" May Get on Cotton

Cotton fields bordering on freshly tarred roads (thrown by car or truck wheels).
Dropped from airplane wheels while dusting crop.
From wagon wheels while hauling cotton to gins.
Thrown by tractor wheels at gins.
Loading platforms at gins, warehouses, or mills.
Melted roofs at gins, warehouses, or mills.
Re-used bagging and bale ties.
Thrown up by truck or trailer wheels in hauling.
Insides of railroad cars.
Starter switches in fluorescent lights.
Belt dressings, or hard greases.
It has been reported recently that another source of tar is the tarry substance coating on the outside of the bottom of the pickers' sacks, used especially by hand pickers in the Delta region. Many of the sacks supplied to these pickers are about 20 feet long, and the manufacturer of the sacks puts the coating on the sacks to reduce wear when the cotton picker drags them along the rows. Steps are being taken by a national agency to eliminate this source of the trouble.

Testing for Tar Spots

Mills desiring to conduct tests for presence of tar on cotton may secure necessary testing procedure instructions from the Institute of Tex-

tile Technology, Charlottesville, Va.; or from the National Cotton Council of America, Memphis, Tenn.

Steps Which May Be Taken by Mills for Temporary Reduction of "Tar Spots"

Bring to attention of shippers so that bales may be properly covered in transit.
Insist on use of clean railroad cars.
Determine whether tar spots predominate on cotton from different sections; action will then depend on purchase policies of mills.
Check loading platforms and storage facilities at mills for cleanliness.
Check for leaking roofs in mill.
Clean drawing rolls and other places where tar may accumulate.
Determine if "tar spots" are actually tar or some other foreign matter, such as belt dressing, heavy grease, etc.
Brush, rake, or pick outside of every bale before processing; dispose of pickings so that tarred stock is so identified and will not find its way into white stock.
Dispose of or store coated bale ties where flaked-off paint will not find its way into the white stock.
Using test procedure available from NCC or ITT, check cotton received for tar.
(*Textile Industries*, October 1951, 110A-D).

RELATION OF NEPS IN CARD WEB, SIX ELEMENTS OF RAW COTTON QUALITY, AND YARN SIZE TO APPEARANCE OF LONG-DRAFT CARDED YARN

This is the twelfth in a series of reports pertaining to the relationships of cotton fiber properties to performance in manufacturing and quality of manufactured product.

The study upon which the report is based included 828 lots of American upland cotton and 2,484 lots of yarn from the test series for selected cotton improvement groups and the Experiment Station Annual Variety Series, crop years 1945-47. Most of the cottons represented the leading varieties in commercial production in the rainfall and irrigated parts of the American Cotton Belt during that period.

Carded singles warp yarn with semi-hard twist were processed by long-draft roving and spinning equipment from each cotton included in the analyses. All cottons were processed at the same rate of carding, namely, 9½ pounds per hour, with delivery of a 40-grain sliver.

In these statistical analyses, the appearance of carded yarns of various sizes, ranging from 14s to 60s—the range depending upon the staple length of the raw cotton—was used as the dependent variable. Three sets of analyses were made: (1) With the appearance of 22s yarn, (2) with the appearance of the finest yarn spun from each cotton, and (3) with the appearance of three sizes of yarn collectively as representing a comparatively wide range for each cotton.

Seven independent variables were included in the first two sets of analyses, as follows: Number of neps per 100 square inches of card web, upper half mean length (fibrograph), length uniformity ratio (fibrograph), fiber fineness (weight per inch), fiber strength (Pressley), percentage of mature fibers, and grade index of cotton. The same factors and yarn size were used as independent variables in the third series of analyses.

In most cases, number of neps per 100 square inches of card web caused a relatively large effect on yarn appearance and, of the variables identified with the cotton, the nep factor generally proved to be the most important. For nearly all the 26 groupings of cotton, neps in card web ranked first in importance to the appearance of 22s yarn and of the finest yarn spun from each cotton; neps generally ranked second in importance to collective appearance of multiple yarn sizes, being outranked in most cases only by the factor of yarn size.

For the over-all series of cottons, the nep factor of card web accounted for 22 percent of the variance in appearance of 22s yarn, or neps accounted for 14 percent of the variance in appearance of the finest yarn spun from each cotton, or about one-third the total explained; and neps accounted for 11 percent of the variance in collective appearance of multiple yarn sizes or approximately one-fifth the total explained.

The influence of number of neps per 100 square inches of card web on yarn appearance varied somewhat for the various groupings of cotton studied, its contribution being larger or smaller than the values obtained for the over-all series of cottons. For the cottons of 1-1/16 inches to 1-3/32 inches in staple length, for example, the nep factor of card web accounted for as much as 70 percent of the total variance in appearance of 22s yarn explained by the seven factors; 62 percent of the total variance in appearance of the finest yarn explained by the seven factors; and 24 percent of the total variance in collective appearance of multiple yarn sizes explained by the seven factors and yarn size.

In general, the larger the number of neps for 100 square inches of card web, the finer the fi-

bers, the longer the cotton, the greater the variability of fiber lengths, and the finer the size of yarn, the lower is the resulting yarn appearance. The contribution of the nep factor of card web and yarn size on yarn appearance is relatively strong and always in the same direction.

Yarn size, neps in card web, fiber fineness, and percentage of mature fibers were the order of rank of importance for the four variables making a statistically significant contribution to yarn appearance, when all yarn sizes and all samples of cotton were considered collectively. The ranks of importance of those factors fluctuated with some of the sub-groupings of cottons studied. Yarn size, however, ranked first in all but two cases out of the total 26.

For the over-all series of 22s yarn, only two of the six elements of cotton quality were found to influence yarn appearance to the extent of being statistically significant. Those properties, ranked in order of importance, were nep count of card web and fiber fineness.

For the finest yarn spun from each of the entire series of cotton, with due regard to staple length, three fiber properties made contributions of statistical significance to yarn appearance. In the order of their importance, they were neps in card web, fiber fineness, and percentage of mature fibers.

For most of the sub-groupings of samples, grade of cotton, percentage of mature fibers, and length uniformity ratio showed only a small effect on yarn appearance. For several of the groups of cottons, however, each of these factors made statistically significant contributions to yarn appearance. Fiber strength, within the range represented by these cottons, was of no importance to yarn appearance. (USDA Report #12, October 1951, by Robert W. Webb & Howard B. Richardson).

NEW FABRIC GUIDER

Practically all fabric guiders function by means of guide rollers between which the selvages of the fabric pass. These guide rollers are either permanently or intermittently in contact with one another and are rotated about their axis by the cloth itself being drawn through them by the machine to which it has to be guided. This means that the cloth has to be under enough tension and to be strong enough to overcome the resistance of the rollers without stretching the edges or distorting the fabric.

In modern practice, many fabrics have to be finished without any tension whatsoever. Others, being of an elastic nature would stretch at the edges rather than rotate the guide rollers. It is to deal with these conditions that Daniel Foxwell and Son Ltd. have introduced a modified version of their well known pneumatic guider in which the guide rollers are driven at a surface speed equal to that at which the cloth is running, this drive usually being obtained from the machine to which the guider is applied. By this means, no resistance whatsoever is applied to the cloth passing through the nip rollers, and therefore it is possible to guide the most delicate and elastic fabrics without any chance of stretching or distorting them, and without applying length tension.

Accurate guiding of very thin plastic materials is also possible with this particular type of guider, which has been exhaustively tested with complete success in varying conditions on all types of fabric. (*British Rayon and Silk Journal*, September, p. 62.)

TEXTILE MANAGEMENT

Is amount of time wasted at a minimum in your plant? One of the managers in a North Carolina textile mill had to be shown. And was shown that out of every working day, a certain worker was unconsciously wasting three hours. Many other problems and examples such as this are cited at the Business and Industry Institutes held each Summer at the University of North Carolina at Chapel Hill, N. C.

The key men of the textile industry who attend the institute agree unanimously that they profit a great deal from their intense study. By putting to practice the things they learn in supervisory training, job improvement methods, and time study, the courses taught at the institutes, they could increase the efficiency of their employees beyond past records.

A textile mill is best qualified to train its management personnel in those methods and problems particular to itself. But understanding and sound appraisal of the practices and policies of an individual firm can be increased by examining them against a background of general principles and the practices of other mills. In the classrooms, actual business problems are used to illustrate and develop management principles. Movies and other visual aids are also employed.

The main purpose of the "Job Improvement Method" study is to teach the manufacturers to take notice of the job methods, and to influence them to improve the methods used in their own mills. In most textile mills, there are several possible ways of job improvement. There are short cuts that can be taken, short cuts that have

been overlooked by many old-time manufacturers. Short cuts of the proper type would not, by any means, mar the quality of the product, but would do away with unnecessary motion that is used in the production of many goods.

The manner in which some machines are set up causes the operator to take many unnecessary steps and make many uncalled for operations. By economizing on the motions that are made, much time is saved, efficiency is increased, and production is speeded up to a great extent.

The main trouble in efficiency on the job, in most cases is caused by the foremen. The mill foreman is not concerned with the time and steps required to do a job well. All that he is concerned with is the quality of the article being produced.

Time Study is to establish a fair day's work for a fair day's pay, the determining factor in the amount of work that a worker should do in a day. To carry on a time study effectively, there should be a standardization of all conditions surrounding the work, such as materials, tools, machinery workplace, and working conditions. Also there should be a standardization of method.

A recent development in Method-Time-Measurement, or MTM, was taken up. MTM was first practiced in 1948. Since that time, its popularity has increased considerably. The main principle involved is that the hands make only certain movements. These movements are lifting, moving, placing and adjusting a given article. Through much research and study, charts have been prepared to determine how much time is required to do a certain job. For example, moving a storage battery from one location to another requires the same amount of time required to move a paper bag the same distance, allowing a correction factor in the charts for the difference in weights.

By using MTM charts, executives may determine the exact time, in a matter of minutes at their office desk, required to do a certain job. For example, suppose a corporation was placing a bid on a large government contract, a job larger than this particular company had taken previously. The president of the company knew that his firm was capable of doing the job, but did not know how long it would take to complete the requirements of the contract. By the use of MTM charts and tables, the exact time of this large task was computed. Thus, by knowing the exact time required for the completion of the job, the bid was placed with more accuracy. By knowing the time required, lower bids may be placed with a minimum of risk. (*Textile Bulletin,* August 1951, pp. 44, 46, 48.)

SLASHER FOR TEXTILE YARN

In a slasher adapted for sizing yarn strands as warp ends in a weaving operation, and in which the yarn strands are trained in sheet form through a sizing bath from which the sized sheet is withdrawn through squeeze rolls to a dryer, the improvement comprises a series of grooved rolls as the sole yarn carrying element interposed between the squeeze rolls and the dryer and arranged for training each sized yarn of the sheet directly and separately from the nip of the squeeze rolls, whereby the sized yarn strands are separated while wet at the nip of the squeeze rolls and then disposed in separate spaced relation for drying. (USP 2,565,407).

VARIED ANGLE RING TEMPLE

Two important advantages are said to accrue from the use of the Broell Ring Temple Roll which is based upon the varied angle principle and utilizes eccentric spacers that increase the pitch of the rings progressively from the inside toward the selvage:

(1) A minimum pull is exerted upon the fabric at the center with tension increasing toward the selvage and maximum pull being attained at the selvage itself;

(2) A screw-like movement is imparted to the fabric due to the construction of the eccentric spacers, thus keeping the fabric pulled toward the selvage in a continuous motion.

Eight different types of rings (burrs) are available for all fabric ranges, including double selvage rings. All rings are standardized to one size and thus are interchangeable in all details from one barrel to another.

Construction of the barrel allows for a straight line application of the burrs to the fabric. All rings penetrate the fabric at all times. The entire barrel is a solid locked unit, whether mounted on the temple or off. The entire unit may be disassembled while mounted on the temple stand proper since the barrel is assembled from the cap end.

Unit is obtainable in all ring lengths, starting with a single ring to a maximum of 12 rings. All of these lengths will fit any temple stand presently in use, the manufacturer states. Other lengths with more than 12 rings can be manufactured for special applications. Mfr.: Broell Mfg. Co., Windber, Pa. (*Textile Industries,* October 1951, pp. 107, 185.)

SUPERIOR PRE-OPENER AND CLEANER

The Superior Pre-Opener and Cleaner has been developed for use between Blending Feeders and Conveyor Aprons. A Pre-Opener and Cleaner

is installed to receive production from each feeder and deliver to the Feed Apron which delivers the accumulated load to the regular cleaning line. In handling the light production (100 to 250 pounds per hour) from a Blending Feeder, the Pre-Opener and Cleaner does a maximum job of opening and cleaning, and with no staple damage. After passing through the Pre-Opener and Cleaner, cotton is delivered to the regular cleaning line in a thoroughly opened and pre-cleaned condition.

Superior Pre-Openers and Cleaners have been installed in several mills, and each reports an increase of 30 to 50% in cleaning efficiency.

After receiving partially opened cotton from Blending Feeders, the stock is carried through the Pre-Opener and Cleaner progressively over its 134 vibrating grid bars, by 3 beater cylinders. The beater cylinder are equipped with streamlined pins so that turbulence is reduced to an absolute minimum. There is no air draft in the Pre-Opener and Cleaner to interfere with the centrifugal effect of the beaters, or to carry small leafy particles, dust, fly or other refuse on with the cotton.

The Pre-Opener and Cleaner is constructed of steel and grey iron castings. The 134 vibrating grid bars are from high grade spring steel. The individual cylinders are driven with v-belts, and ball bearing idlers are used to maintain proper tension. All v-belts and sheaves are properly housed and guarded, with adequate access doors.

Each Pre-Opener and Cleaner is driven with a 1 HP motor when handling square baled and compressed cotton, or a 1½ HP motor when handling high density cotton or card strips.

MOTION STUDY IN WOOLEN SPINNING

Outside consultants increased production and cut costs at James Watkinson and Sons Ltd. by investigations in carding and spinning departments worked out as follows:

(1) The carrying out of the systematic visual observations throughout the process and the recording of data. This included the study of an operative's work around the machine, the operative's performance, the machine performance, material requirements, ancillary duties and equipment, suitability of plant lay-out and the work area, and the study of the flow of material through the different processes.

(2) A detailed analysis of the data thus assembled, and in some cases an analysis of movies taken of elements of an operation to discover unproductive or awkward movements, etc.

(3) The development of new methods from the preceding analysis; these might include detailed plans for the alteration of jobs, the lay-out or modification of machines and, where necessary, proposals for the establishment of training drills for operatives. (*Textile Manufacturer*, September 1951, pp. 424-426.)

TESTING AT HIGH HUMIDITY NEEDS ATTENTION

A heretofore neglected aspect of textile testing, but one which in the future must command considerable attention on the part of the textile technologist, is that of evaluating textiles under high relative humidity, or even wet conditions. The technical literature shows an apparent dearth of information and appreciation of its importance.

One of the many functions of the research laboratory is the continued attempt to predict end-use performance from laboratory tests. Standard conditions of 65 per cent relative humidity and 75 degrees Fahrenheit, as accepted by the United States Government and other professional organizations, are satisfactory for testing "dry" properties of materials, and for quality control, but analyses of the mechanical properties of textile fibers demonstrate that these properties vary widely under changing humidities. This, of course, is the reason why constant humidity and temperature conditions must be available in the textile laboratory.

Textiles are used under everchanging conditions. In the summertime the relative humidity rises appreciably higher than the 65 percent textile standard. Furthermore, the relative humidity in close proximity to the human body is apt to approach the saturation point and oftentimes reaches it. Perspiration under the arms, the back, crotch, etc., adds to this high humidity and wet effect. Hence "dry" testing of fabrics may be a snare and a delusion. The industry should give serious consideration to the utilization of high humidity standards, at least for some end-use items.

As an example of the approach which can be used, let us examine the somewhat bromidic subjects of "Crease Resistance" and "Dimensional Stability," as well as "Abrasion Resistance" and its counterpart, "Wear Resistance."

One of the standard methods for testing crease resistance in the laboratory is the "Toolal Broadhurst Lee Crease Angle Recovery Test" wherein a 4x1 centimeter specimen is creased under a constant force for a constant time, and the crease angle measured for a selected recovery

time. Modifications of this technique are utilized in the American Cyanamid Roller Pressure Tester and the Monsanto Wrinkle Recovery Tester. The usual procedure is to evaluate fabrics, particularly those treated with crease resisting finishes, at 65 per cent relative humidity and 70 degrees Fahrenheit, with too little thought given to the fact that in use the humidity may go higher. (*Daily News Record*, Sept. 6, 1951, Section 2, pp. 6, 14.)

MECHANICAL TIME STUDY

As a young man, I was employed by a textile mill in this country for eight years, from 1909 to 1917. Those years gave me a wonderful opportunity to meet some of the outstanding pioneers in the scientific-management field.

Being a member of the Taylor Society I was able to follow the vivid discussions of the revolutionary ideas and new philosophies which were highly debated and opposed at that time. Today, we have accepted the ideas of scientific management; we have seen them become co-ordinated, integrated, and further developed. Today they constitute an essential part of our thinking. It is difficult to look back to those days and to understand how the enthusiastic and burning discussions penetrated and exploded our earlier viewpoints on industrial problems.

The textile mill I worked for called in Emerson as a consulting engineer, and I got a practical education in the application of the principles and systems of such as Taylor, Emerson, Gantt, and others have had a fundamental influence on my work throughout the years that followed. During the 30 years of work in a textile mill in Sweden, I have had excellent opportunities to practise the ideas and to apply the time-study taught me here in the United States.

When I speak of time studies, it is not in the narrow sense of the words; I think in terms of the comprehensive definition given, for example, by Maynard, Stegmerten and Lowry, which is as follows: "to subject each operation of a given piece of work to close analysis, in order that every unnecessary operation may be eliminated and in order to determine the quickest and best method of performing each necessary operation; also to standardize equipment, methods, and working conditions. Then, and not until then, to determine by scientific measurement the number of standard hours in which an average man can do the job."

My presentation of mechanical time studies will deal with mechanical devices that record the utilization of the various productive machines on a time chart. The machines are connected directly with the central registering instrument. I wish to demonstrate how these mechanical devices can become a valuable auxiliary tool for the analysis of productivity as well as for other management and control functions.

The principal purpose of time study is to improve work methods. To obtain good results, we must have well-trained and qualified time-study personnel and good co-operation between the various departments of the company. Wholehearted top management support is another important necessity.

A time study carried out in the traditional way is, in general, done once and is also limited in time because of economical reasons. On the other hand, we should quite often like to extend the study and thus be able to analyze the causes of delay more thoroughly. This, perhaps, would enable us to eliminate some of the hidden weak points and increase the efficiency of the machines. An effective utilization of machines is especially important with the expensive machinery used in the textile industry.

If we wish to achieve the advantages offered by long-period studies, we have to depend on other and more economical means than the manually handled stop-watch.

Stop-watch time studies also have other shortcomings as a result of the limitations of human senses and judgments. The reading of a stop-watch is not an accurate fixation of the time. It is also difficult for a time-study man to follow and record the operations on more than a few machines.

In the past few years a new work-measurement technique, "methods-time measurement," has been developed. This procedure makes it possible to set accurate standards on manual work without using a stop-watch. It does not involve the same amount of inaccuracies and judgment as time studies, but the need for an accurate device for the timing of the machine time has not disappeared. We have a very well-balanced combination when we use the mechanical registering device to follow the machine time and methods-time measurement for the analysis of the manual work.

When we have analyzed, simplified, and standardized the work methods, we can base the wage-incentive system on the resulting standard times. This will make the workers interested in keeping the delay time down to a minimum.

Unfortunately, however, the workers are able to influence only some of the down time. For

instance, delivery of the material or down time caused by repairs is outside the control of the workers. Management has the responsibility for the attainment of the best possible result of production. To obtain it, management has to help the workers with the elimination of delays and down time.

We have a means for this down-time control and for the prolonged time analysis in mechanical registering instruments. These have been constructed in Sweden, where they are widely used. When we in this way extend the time studies to a continuous analysis, we actually have dissolved the border line between time studies and the control of the working of the machines. The time study has become part of the production-control function.

Four of the best known and most widely used makes of Swedish central registering devices are as follows: L. M. Ericsson's "Centralograph," AB Ljussignaler's "Central-Instrument," AB Telesignal's "Tempograph," AB Elsignaler's "Elektrograph." (*Textile Manufacturer*, by A. N. Engblom, pp. 390-4, August 1951.)

DRAFTING IN WORSTED DRAWING AND SPINNING

From an examination of irregularities in sliver, roving, and yarn, Goodings drew the following conclusions. In the first place, it will be seen that they took the form of a wave-like effect and these were fairly constant in wave length. In the second place, it will be seen that the height of the waves, or the amplitude, varied considerably and was far from constant. This amplitude variation showed an increase at each operation and reached a maximum in the yarn.

In order to verify that the wave effect is independent of draft the same Botany slubbing was drawn, one end up, with drafts of 7.8, 11.1 and 16.2 and the slubbings analyzed as before. The results showed that the distance between consecutive maxima or minima remained the same in all three cases and equal in value to that previously found in the complete drawing process. But the amplitude, or extent, of the irregularity increased with the draft and it also became more regular in wave form.

Further experiments drawing single ends showed that both varying the amount of twist and altering the length of ratch did not affect the periodicity of the wave form.

In order to see how the type of wool affected the wave formation a series of slubbings made from a variety of raw materials were drafted, one end up with varying drafts and in each case the same phenomena were observed, that is, that the drafting conditions affected the amplitude of the waves but not the wave length. The latter did, however, vary from wool to wool.

In conclusion, it must be emphasized that the experiments which showed the wave effects most clearly were those in which the wool was given a high draft and drawn from a single end. In practice the wave effect is subdued by the doublings and the number of drawing operations but it is always present. (*Wool Review*, July 1951, p. 24.)

SPIKED APRON MAGNETIC SEPARATOR

A recently developed spiked apron magnetic separator specifically designed for textile applications is a completely packaged unit ready for installation. "Spike," as the separator is named, will halt tramp iron traveling in the processing lines of cotton, waste, and woolen mills. The magnets used are made of Alnico V and have extremely high pulling power, according to the manufacturer.

Maintenance is simple; cleaning is easily accomplished by using the lift handles to swing back the magnet. Separator is fully guaranteed against loss of magnetic strength for the life of the unit on which it is installed. Available in sizes to fit any feeder. Mfr.: Eriez Manufacturing Co., Erie, Pa. (*Textile Industries*, August 1951, p. 83.)

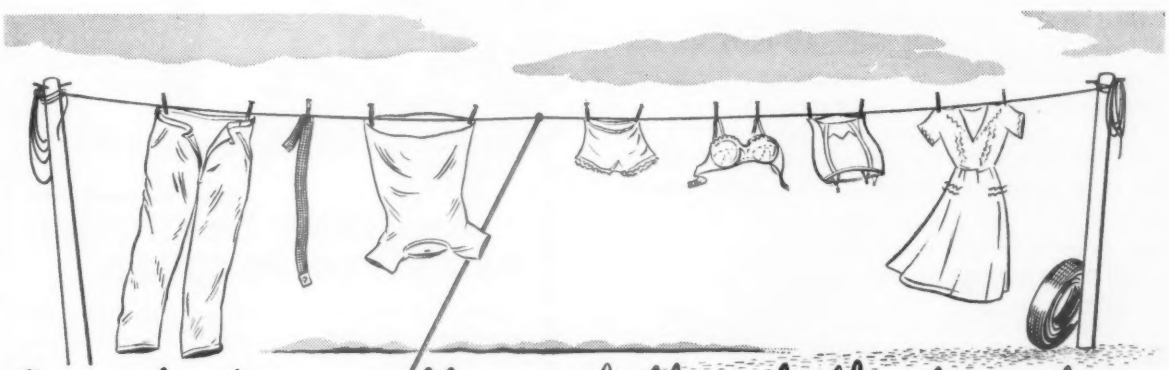
ELECTRICAL INSTALLATION PROBLEMS IN THE FINISHING PLANT

Though the design of the steam facilities for a finishing plant is not strictly within the province of the electrical man, the two are very closely tied since finishing plants are such large heat-users that it is the usual thing for a considerable portion of the electricity in such a plant to be furnished by bleeder turbines, and the rate considerations that must be studied before sizing the turbines is the province of the electrical man. The actual design of the steam power plant offers nothing particularly unusual except the amount of thought that must be given to reliability of both the steam and electric equipment. The amount of goods that can be ruined by a steam or a power failure can border on the fantastic, and extra thought given to reliability and the possibility of making quick changes to cut damaged electric equipment out of circuit will show up in the shadowy credit you seldom receive for not having shutdowns. In this connection, studies must be made of the breakdown service available from nearby utilities, whether they are company owned or public.

The choice of the basic power pattern of a finishing plant depends largely on the size of the job and whether it is a plant that "just grew" or is being built new. In finishing plants of the size recently built in the South, the radial feeder distribution system would be too expensive and too inflexible to be considered since the buildings cover large areas and finishing machinery is always being re-arranged in location to be put in range for some new type of process. The logical choice is then one that is some variation of the load-center distribution method, and a suggested attack would be to feed the load centers from a radial or ring-high voltage system, with the transformer equipment and low voltage switchgear located so feeders of fairly respectable capacity could be overlapped into the area served by the adjacent sub-station without too much expense. This would appear to call for more substations that could be economically justified, but in a plant where growth is expected and re-arrangement is a foregone conclusion, the extra cost for furnishing the power through more and smaller substations is often less than one would at first think.

If this pattern be chosen, the high voltage distribution can be arranged in any orthodox manner, with either overhead lines or underground cables — depending largely on terrain and substation and power plant location — delivering to outdoor transformers feeding low voltage power to switchgear mounted in rooms cut off from the rest of the plant and suitably ventilated to a clean atmosphere. If management can be persuaded to give up a little extra room for future low voltage cubicles, such room will probably be found most useful, and sometimes a dire necessity.

A short study on the fault currents available at the low-voltage terminals of various sizes of transformers and a check on the price of circuit breakers for this maximum rating will almost automatically size the load-center equipment and set its spacing around the plant. The cost of running feeders of various amperage capacities will also serve to size the low-voltage breakers, and it is expedient to buy this equipment all of one size so a spare transformer or a few spare breakers will fit anywhere on the system. In certain critical areas, particularly of dyeing machinery, it is logical to provide loops of extra high voltage cable so an underground cable failure will be handled with a minimum of shutdown time by swapping disconnect switches. In similar areas it is often chosen to provide a low-voltage tie to give



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feed from two substations being fed through separate cables, so the important machine can be fed in event of a cable, transformer, or low voltage switchgear failure. Provision of such ties and fans to increase the overload capacity of the back-up transformer often give the maximum of safety at the lowest cost. (*Textile Age*, August 1951, pp. 22-7.)

LOCK PLATE TO PREVENT OUTSIDE HOOKS OR EYES FROM TURNING

In many mills the harness is levelled by turning the outside hardware either in or out with the result that in a very short time the hardware becomes loose and can readily turn. Where heddle frames run closely together this will result in cutting and damaging adjacent frames.

The Steel Heddle Mfg. Co., having received numerous requests to devise a means for preventing outside hardware from turning, has recently developed an arrangement which will prevent the ruin of countless shafts due to this turning. One, in fact is so simple and low in cost, it has aroused considerable interest among mill people all over the world.

The Stehedco lock plate not only is simple in construction, but is also easily installed. It consists of a short metal rod shaped to fit the bevel of the frame — one end of which is rectangularly slotted to fit the swaged portion of the hook, the other is simply fastened to the frame with either a screw or nail according to preference.

Once locked in place, the hook cannot be turned at all for the purpose of levelling harness. For that particular function harness adjusters are available, and where outside hooks are used, fiber connectors are recommended to save wear of the hook on the harness adjuster as well as the outside hook.

DEVELOPMENT OF MODERN AIR CONDITIONING

The science of air conditioning first originated in the textile industry. Much credit for what was to be the modern methods of humidification and atmospheric control is given to Mr. Stuart W. Cramer who, in 1904, first introduced the term "air conditioning" to describe his new method of combined humidifying, air cleansing, heating, and ventilating.

In the days of hand spinning and hand looms, humidity could not cause trouble, due to the slow speed of the operations. However, beginning with the time of the first power-operated frames and looms, atmospheric difficulties did develop, and the important advantages of proper humidity were recognized. During this era, mills were

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ANOTHER Stehedco PATENTED FEATURE

Included among the 200 patent grants awarded to the Steel Heddle Mfg. Co., is one for the T-12 Slide Hook, illustrated.

Outstanding in service, the STEHEDCO T-12 is the best and most efficient Slide Hook on the market today. The T-12 reduces binding on the bar, because it has a longer bearing surface for the most FREE SLIDING.

SELF ADJUSTING, it permits minimum separation of heddle and is longer wearing . . . more economical.

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erected on sites known to be favorable to mill operation. One of the reasons for building mills on the banks of rivers was to receive the added benefits of the high humidity created by the nearby water. Later, simple methods of humidification were employed such as water troughs leading through the rooms, sprinkling of floors, and steam "vapor pots." All of these very crude methods were soon rendered obsolete, and a great deal of attention was devoted to the development of properly designed systems of humidification. As the knowledge of humidification became greater, it was found that the problem became more extensive. In time atmospheric control encompassed more than simple humidification and ushered in the developments ultimately covered by complete air conditioning.

During the first period of simple direct humidification and independent heating, humidity was increased only to the point where static electricity was held under control. As the benefits of humidity became better understood, units of higher humidifying capacity were installed. Today, well-engineered systems of humidification or air conditioning utilize the powerful cooling effect of evaporation to reduce room temperature during much of the year. Maximum use of this cooling effect of evaporation is made possible by systems which combine controlled ventilation or "air changing" with adequate humidification of either direct or central station types — refrigeration may be employed.

Adequate humidification or air conditioning is generally considered a good investment in the modern textile mill, principally:

1. To insure retention of the natural moisture content in the material.

2. To improve further the running of those textile machines which themselves contain moisture-sensitive or temperature-sensitive parts.

3. To improve weight, feel, appearance, uniformity, and other physical characteristics, and to make the final product more saleable at a better price.

4. To improve working conditions for the operatives by making the atmosphere fresher, cleaner, cooler, less stagnant, and more nearly constant in temperature and relative humidity the year 'round.

Four principal types of humidifying and air-

The *Engineer* focuses the light of many minds

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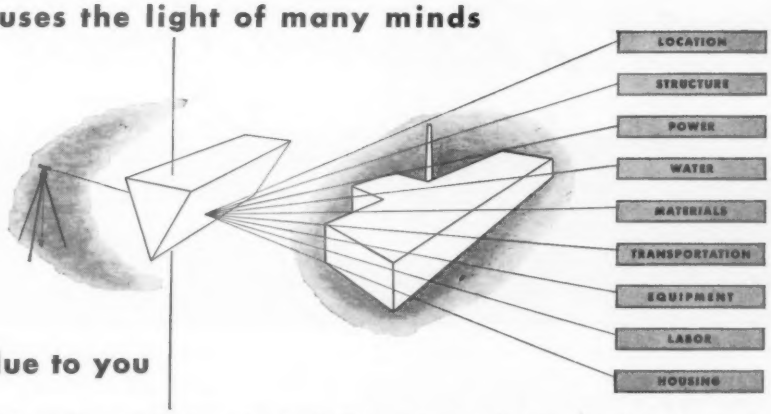

As used here, the term Engineer is plural. No one man could have experience in all the varied services which you have the right to expect from a well-organized firm of Engineers.

Civil, mechanical, electrical, chemical, industrial engineers, architects and other professional specialists must all supplement each other in the successful consummation of an industrial plant.

A well-executed project is the fruit of integrated thought and effort, of finely balanced teamwork.

The Engineering organization that delivers multiple comprehensive service does so because it combines able personnel with long experience. These are important factors when you want to select an Engineer whose counsel, plans and design will help safeguard your investment in plant construction.

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conditioning systems are used for textile mills:

1. Direct humidification with or without separate independent means for heating. Direct humidifying systems include:
   a. Centrifugals and water-under-pressure heads with fans to distribute the spray.
   b. Compressed air "atomizers," to which water is fed either by gravity or under pressure. A recently developed system of atomizer humidification operates continuously with output graduated automatically.
2. Combined systems of direct humidification and one or more forced air changing units with or without dry duct distribution of air throughout the room.
3. Ceiling station systems consisting of one or more forced air-changing units with wet duct distribution of air (i. e., humidification within the ducts), or with one or more ceiling air distribution.
4. Central station systems with all the desired air conditioning functions located in each central "air-washer" unit and with dry duct distribution of the fully conditioned air to the room or rooms, or with some local booster humidifying or heating capacity for greater flexibility or economy.

Systems 2, 3, and 4 may include heating and filtering. Systems 3 and 4 may include refrigeration. All of the systems listed are widely used at the present time, each having its advantages for a variety of plants, departments, and individual requirements. Concerns having designed, manufactured, and installed these systems for many years are qualified to recommend what is needed in any given case.

Dry-bulb temperature is shown by the ordinary mercury thermometer, wet-bulb temperature by a similar thermometer covered by a wet wicking. Simultaneous readings of these two temperatures are useful in determining relative humidity. Dew-point temperature is the temperature at which condensation begins to take place when air is cooled without adding or removing moisture. In textile mills, dew point is important as the temperature below which rooms may not be cooled during shut-down periods without rusting of machinery. Effective temperature is an index of the feeling of warmth of the atmosphere and depends upon temperature, humidity, and air

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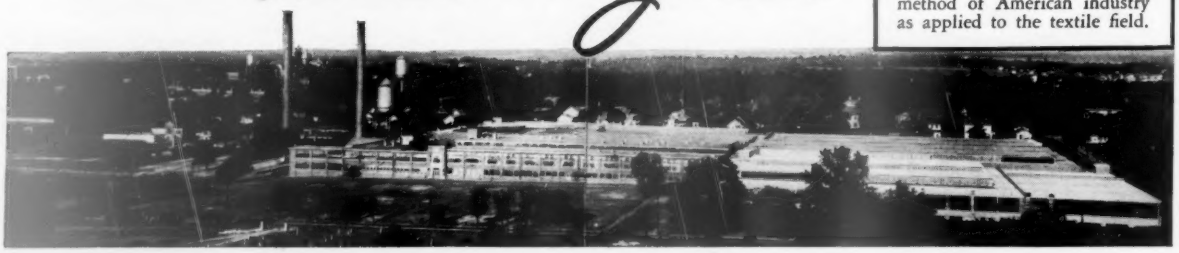
Rock Hill Printing and Finishing Co., Rock Hill, S. C. . . . the largest cotton printing mill in the South. This plant typifies the low cost mass production method of American industry as applied to the textile field.



To the many diversified problems of its clients, Lockwood Greene Engineers bring not only full appreciation of modern operating requirements but a background of over 100 years of continuing engineering service to the textile industry.

This service includes: plant site investigations, design and engineering, construction supervision, modernization, air conditioning, water and sewer systems, power and steam plants and housing projects. Also appraisals for finance, tax, insurance and other purposes.

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motion. Charts are available for determining effective temperature from readings of the sling psychrometer and air velocity meters. Knowledge of effective temperature values has helped manufacturers of humidifying and air-conditioning systems to make sound recommendations regarding conditions to be maintained and the required humidifying and cooling capacities.

Absolute humidity is the actual density of water vapor in the atmosphere at any given time, usually expressed in grains of moisture per cubic foot of space. Relative humidity is the ratio of the actual vapor pressure to the vapor pressure at 100% humidity at the same temperature. Relative humidity is also the ratio of the actual weight of vapor present in a given space to the weight of vapor in the same space at 100% humidity and at the same temperature. (*Saco-Lowell Bulletin*, June 1951, pp. 34-8.)

TAR SPOTS

We told you about the efforts made to eliminate the coated bale ties from the cotton trade, since such ties were believed to be the principal cause of the damage. It was found that the tar solution in which the bale ties were dipped had a bad habit of softening and thereby staining the cotton.

Through subsequent efforts on the part of various organizations, the three principal manufacturers of bale ties were induced to stop the coating practice and, as we understand it, practically no ties have been coated since 1948. It is true that quite a few bales which were bound with coated ties went into the Government loan in 1948, and some of these are still coming out, and will probably continue to come out for some time.

Nevertheless the elimination of the coated tie did not bring a complete end to the problem. Small black spots continued to appear in fine goods production, as well as in the coarser constructions when they were finished in the lighter shades, such as pastels. One theory was that bale ties made a number of years before were still in the trade, because it was the custom until a few years ago to sell used ties to junk dealers who beat them back into shape and then resold them to the gins. As a result of a considerable amount of publicity, however, most textile mills were induced to discontinue the selling of coated ties and this helped immeasurably in eliminating them from the channels of trade.

In spite of all of these efforts, we still do not seem to have found the solution to this puzzling problem. Mills receive cotton bound with unpainted ties, and yet when the bagging is removed, small bits of tar are found adherring to the surface. One mill man tells us that there is some division of opinion as to whether the tar is also found on the inside of the bale. He contended that at his mill he had never found any evidence of tarry substances except on the outside. He reported, however, that another mill had found small lumps of tar virtually in the center of a number of bales.

Still another puzzling factor is that frequently there appears to be no tar on the surface of the bale, but by the application of certain chemicals and through the use of an ultraviolet light, the signs may be detected.

The past several years a number of possible causes have been suggested. One of the most prevalent of these was that asphalt was picked up from the highways by the tires of trucks hauling the cotton, and then it was thrown from the tires to the cotton. Another theory was that vehicles, passing along tarred roads, had spattered the tar on the adjacent cotton fields. Neither of these would seem to account for the large amount of trouble some mills are having.

One or two mills have felt that some sort of asphalt base substance was dropping from the fluorescent lights causing the damage, while others have claimed that the interiors of railroad freight cars are, in some cases, painted with an asphalt base paint, which has been the principal source of the difficulty.

But whatever the cause, we still seem far from finding a solution. Mills which weave dark goods, such denims, are not troubled with it, nor is there much trouble with any type of goods when cotton fabrics are scarce, and market prices are high. The problem seems to come to the front mainly when market conditions begin to slide and buyers are not particularly anxious to accept shipments. By this statement we do not mean to imply that the disturbances over tar spots have been caused by buyers who were banded together to thwart the sellers. We simply mean that the problem has been accentuated by market conditions.

It seems that what is needed is a practical fact-finding survey which would try to eliminate the variables and, if possible, pin point the source of difficulty. If it can be determined that all of the cotton with the offending tar is coming from one particular locality, then that would be a long step in the right direction. If tar comes from the interiors of railroad cars, then it should not be too difficult a matter to remedy. (*Textile Industries*, August 1951, pp. 77, 79.)